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ABSTRACT

This manual is a first effort to begin to identify, describe, and develop procedures for assessing various aspects of digital reference service. Its overall purpose is to improve the quality of digital reference services and assist librarians to design and implement better digital reference services. More specifically, its aim is to: assist librarians and others to develop ongoing programs of assessment of digital reference services; provide a practical set of guidelines and procedures for how assessment of digital reference services can be done; and develop standardized procedures and definitions of statistics and measures that may be compared across different libraries. The first chapter is an introduction that provides a short background discussion on digital reference service, outlines the need for digital reference evaluation, and describes the purpose and format of the manual. The second chapter describes the various statistics and measures selected for inclusion in this manual. The chapter is divided into the following sections: Descriptive Statistics and Measures; Log Analysis; User Satisfaction Measures; Cost; Staff Time Expended; Other Assessment Options; and Quality Standards. Each statistic and measure is described in terms of these general categories: Definition, Rationale, Data Collection Procedures, and Issues and Considerations. Appendixes include sample forms, reports, logs, worksheets and survey instruments; and other statistics and measure considered for the manual. (Contains 14 references.) (AEF)

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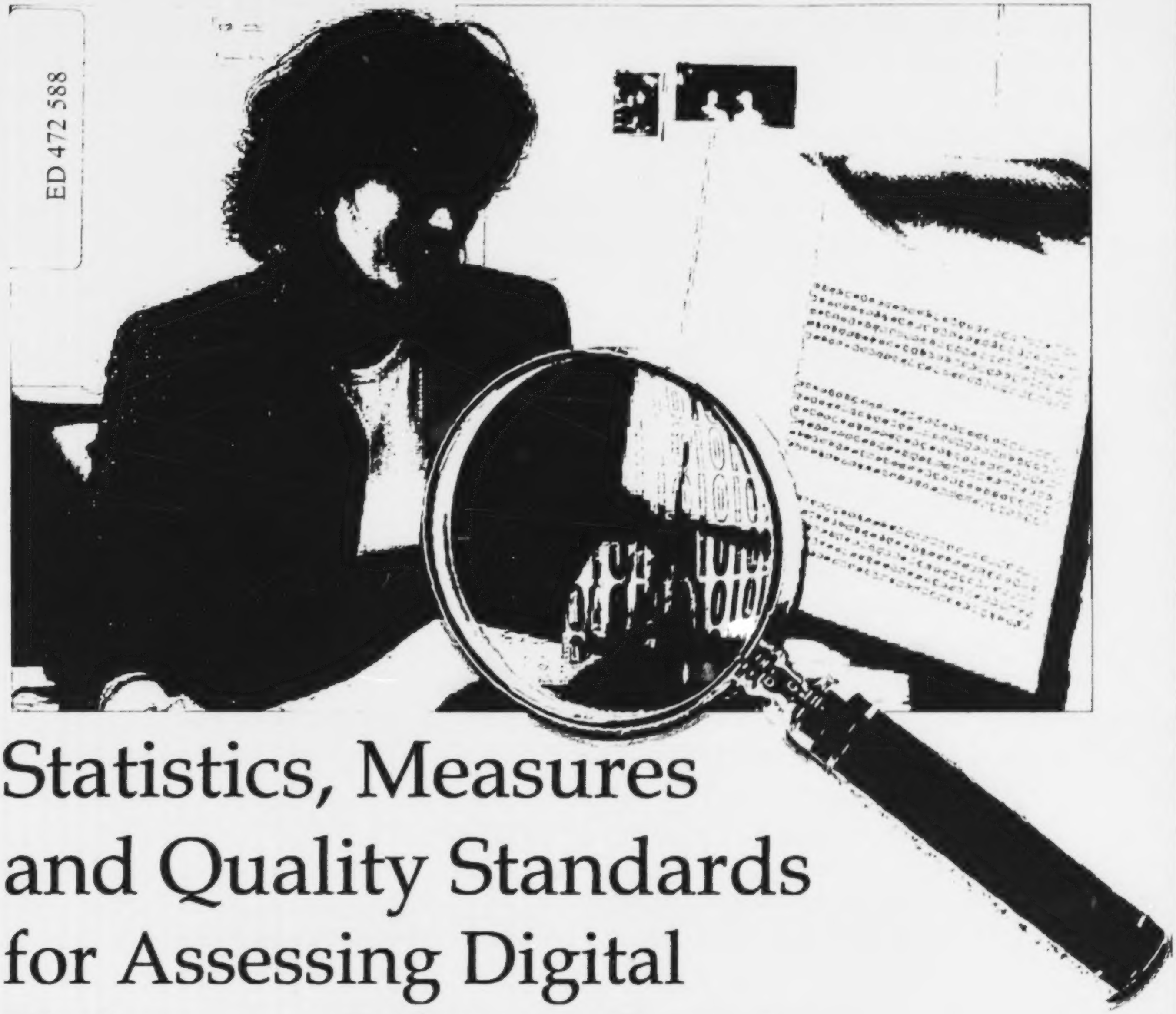

Statistics, Measures and Quality Standards for Assessing Digital Reference Library Services:

Guidelines and Procedures

IR058539

Charles R. McClure
R. David Lankes
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Statistics, Measures, and Quality Standards for Assessing Digital Reference Library Services: Guidelines and Procedures

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TABLE OF CONTENTS

Page

Table of Contents ii

Preface iv

Acknowledgements v

Chapter 1: Introduction 1

Chapter 2: Digital Reference Statistics, Measures, and Standards 9

Descriptive Statistics and Measures

1. Number of digital reference questions received 9
2. Number of digital reference responses 11
3. Number of digital reference answers 12
4. Number of questions received digitally but not answered or responded to by completely digital means 14
5. Total reference activity – questions received 16
6. Percentage of digital reference questions to total reference questions 17
7. Digital reference correct answer fill rate 19
8. Digital reference completion time 21
9. Number of unanswered digital reference questions 22
10. Type of digital reference questions received 24
11. Total number of referrals 26
12. Saturation rate 27
13. Sources used per question 28
14. Repeat users 29

Log and Report Analysis

15. Number of digital reference sessions 31
16. Usage of digital reference service by day of the week 32
17. Usage of digital reference service by time of day 33
18. User's browser 34
19. User's platform 35

User Satisfaction Measures

20. Awareness of Service 36
21. Accessibility of service 37
22. Expectations for service 38
23. Other sources user tried 42
24. Reasons for use 43
25. Reasons for non use 44
26. Improvements needed/Additional services that need to be offered 45
27. Satisfaction with staff service 46
28. Delivery mode satisfaction 49
29. Impact of service on user 50

30. User demographic data 51

Cost

31. Cost of digital reference service 53
32. Cost of digital reference service as a percent of total reference budget 53
33. Cost of digital reference service as a percent of total library or organizational budget 54

Staff Time Expended

34. Percent of staff time spent overseeing technology 56
35. Percent of staff time spent assisting users with technology 57

Other Assessment Options

Peer review 59
Enhanced reference transaction logs 59
Librarian discussion groups 59

Quality Standards 60

Glossary 63

Appendices

I. Sample forms, reports, logs, worksheets and survey instruments 66
II. Other statistics and measures considered for this manual 98

References 102

About the Authors 104

PREFACE

At the 2000 Virtual Reference Desk Conference held in Seattle, Washington, a number of the speakers commented on the lack of assessment techniques and the limited number of statistics and measures that had been developed for digital reference services, and questioned the degree to which traditional assessment techniques could be used for digital reference services. While there was considerable progress with development of digital reference service, there was very limited work being done to assess digital reference services.

Authors of this manual asserted to conference attendees that development of such methods, measures, statistics, and standards was essential. In addition, they challenged the audience to work together to support a research project that could assist in the ongoing assessment of digital reference – and ultimately result in some practical guidelines and procedures to conduct digital reference services assessment.

Shortly after the conference, McClure and Lankes proposed a project that would result in a manual to describe specific techniques, statistics, and measures that could be used to assess digital reference services. The project, Assessing Quality in Digital Reference eventually was supported by a number of public, academic, and state libraries in both the United States and in the United Kingdom as well as a number of library consortia and other organizations (see acknowledgements). The original proposal and other project documents can be found at: http://quartz.syr.edu/quality/. The project began in March 2001 and was completed in May 2002. This manual is the primary product of the project.

The process by which the study was conducted began with a review of the existing literature on evaluation of digital reference services. Next, the study team conducted site visits to various libraries participating in the study that were engaged in various aspects of digital reference services. These site visits identified issues and possible approaches that could be incorporated into the evaluation process. A summary of the findings, best practices, and key issues from the site visits can be found at: http://quartz.syr.edu/quality/VRDSiteVisitsummary.pdf.

Based on the literature review, the site visits, and the authors' knowledge of the topic, a draft manual was developed that described a range of assessment techniques, statistics, and measures. The draft manual was reviewed by the project advisory committee and others, and then was revised by the study team. This version of the manual, then, was field tested by a number of libraries participating in the project. The results of the field test identified a number of areas where the manual could be improved. Based on these findings, the manual was re-drafted, reviewed, and appears here in its final version.

Thus, the final version of the manual presented here represents the work of a number of individuals associated with the Assessing Quality in Digital Reference project (see acknowledgements). The authors see this manual as a first step to beginning an ongoing process to develop statistics, measures, and quality standards to assess and improve digital reference services. We hope that others will be able to build upon this manual and continue such assessment work in the future.

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Florida State University Library
Multnomah County Library (Portland)
Library of Congress
State Library of Florida
Cleveland Public Library
Mid-York Library System (Utica NY)
Bristol University Library (UK)
The Library of Michigan
Syracuse University Library

Their financial support insured that the project could be completed. But more than financial support, members of these organizations and libraries contributed of their time and expertise to serve on the project's advisory committee, to review project documents, and to field test the final draft of the manual. The project and this manual could not have been completed without that assistance.

Also assisting the authors in completing the project and the manual were graduate research assistants at the Information Use Management and Policy Institute at the School of Information Studies, Florida State University. Ruth Hodges, Antoinette Graham, and Amgad Elgohary contributed to this effort by conducting literature reviews, reviewing drafts of the manual, and assisting in the review of field test material.

Finally, thanks go to Anna Maria Lankes, Joanne Silverstein and Pauline Lynch Shostack who work at the Information Institute at Syracuse University and contributed to the project.

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Beverly Choltco-Devlin

CHAPTER 1

INTRODUCTION

Background

One of the fastest growing and most innovative services being developed by libraries today is digital reference. Such services refer to a network of expertise, intermediation and resources put at the disposal of a user seeking answers in an online/networked environment. A digital reference transaction occurs when a question is received electronically and responded to electronically (Bertot, McClure, & Ryan, 2000, p. 12). While the development and implementation of digital reference services has received wide attention during the last several years, only limited attention has been given to the assessment of digital reference services.

Many libraries are now providing digital reference service, either as an integrated component of their regular reference service, as a separate service, or as part of a collaborative consortium. Many other libraries are thinking about or are about to implement such services. Additionally, an increasing number of digital reference services ("AskA") have been developed in the commercial, educational and non-profit sectors that are not directly affiliated with any specific library (e.g., AskJeeves, Internet Public Library, AskERIC). The focus of both library and non-library affiliated digital reference services has been to provide information to the user via electronic means. Many see the provision of digital reference service as a way of increasing access to library services in a manner that is not dependent on physical visits to the library.

People have become increasingly comfortable utilizing and, indeed, relying on digital services as part of their way of life. For example, many people are now shopping, banking, and paying their bills online. They also communicate with others in their personal and business lives by using email or real time services such as online chat, instant message services, or video conferencing. People are also beginning to expect their libraries to provide some type of digital service. These services include access to the online catalog, the ability to place requests online, access to electronic resources and, of course, the provision of some type of digital reference service, which is the focus of this manual.

The provision of digital reference service can take many forms and has developed in a variety of ways. In many cases, digital reference service, as provided by libraries of every type, has evolved naturally and does not exist separately from traditional reference service. Here, reference staff answer questions received both in traditional ways (face-to-face at the reference desk or via the phone) and digitally (most often via email or chat). They often also respond via a combination of traditional and electronic (digital) methods. In such situations, even a single reference transaction can be comprised of a combination of both traditional and digital methods of communication and response (including the provision of the answer). In these cases, the reference staff members are not specifically designated as either traditional or digital reference librarians.

In other library situations, a separate digital reference service has been developed and is offered to users. In such situations, the digital reference service has been designed to function as a separate service from the provision of traditional reference service. Personnel are often assigned to the digital reference service or a completely separate staff exists to provide strictly digital reference service. In many cases, the digital reference service is advertised and promoted as a separate library service, and the points of access to the service (and even in some cases, the provision of service) are not tied to the physical library facility.

These points of access can include a separate digital reference web page within the library's website, a separate email address, or the capacity for online chat, interactive video, or voice over IP sessions (which may also be accessed through the library's digital reference website). Additionally, these digital library services are often available to the user during times when the physical library is not open. And of course these services can be provided regardless of the user's physical location. Indeed, one of the main reasons that a library develops a separate digital reference service is to help meet a user's needs, which may not match the library's ability to provide reference service in a traditional way.

Finally, there are a number of digital reference services that are not affiliated with any specific library. These are often called "AskA" services. AskERIC (http://www.askeric.org) and the Internet Public Library (http://www.ipl.org/ref/QUE/) are excellent examples of such a service. With these services, there is no physical place to which the user goes; all transactions with the service are conducted digitally. The service and staff's sole purpose is to provide digital reference service.

In each of these situations, digital reference service is being provided to some degree. In many cases reference transactions may be comprised of a combination of digital and more traditional methods of communication between the user and the reference service staff. For the purposes of this manual, however, a digital reference transaction is defined as one in which all communication between the user and staff is conducted electronically or digitally. Thus, a digital reference question is counted as such only if the entire transaction is conducted digitally; the question must be received digitally and all responses, including the answer, must be sent digitally.

If a question is received digitally and answered traditionally or with a combination of traditional or digital means, then the question is counted under *Measure 4 – Number of questions received digitally but not answered or responded to by completely digital means*. These definitions of what constitutes a digital reference question and digital reference answer should not, in any way, be interpreted as a belief on the part of the authors that hybrid transactions are not on some level digital reference transactions. Rather, it should be viewed as a method of providing a measure of control and consistency in the assessment process of what is a relatively new and rapidly growing service role, and which has little in the way of precedent or clear and agreed upon definitions.

This is but one example of the difficulty in defining terms such that digital reference services can be described, measured, assessed, and compared. Similar definitional problems were encountered in a range of other statistics and measures described in this manual. Nonetheless, the definitions and procedures offered here can provide a starting point from which librarians and others can begin to evaluate digital reference services on an ongoing basis.

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The Need for Digital Reference Evaluation

In a recent study, Joseph Janes (2002) notes that only 9% of survey respondents, when queried about digital reference, indicated that some type of user evaluation had been done as part of providing the service. If digital reference services are to improve, to better meet user needs, and to develop into a successful and high quality service, evaluation is essential. Such assessment will:

- Determine the degree to which digital reference service objectives are being accomplished.
- Assess how well digital reference services support larger library and/or organizational goals.
- Monitor the status of services and operations to make ongoing improvements and modifications with the service.
- Produce trend data describing use, users, and uses of the digital reference service over time.
- Determine the degree to which user information needs are being met via the service.
- Justify the costs and benefits of the service and demonstrate overall accountability of digital reference activities.
- Compare the relative costs and benefits of digital reference services to traditional reference services.
- Provide data for ongoing planning and development of digital reference services.
- Determine the types of staff training and support that might be necessary.
- Inform governing boards and other organizational administrators of the nature and successes of digital reference services.
- Identify those aspects of digital reference services that need to be revised or improved.
- Encourage digital reference staff to think in terms of outcomes, results, and impacts from digital reference services.

In short, without an ongoing program of evaluation and assessment of digital reference services, the degree to which this new service is "successful" will not be known.

Purpose of the Manual

This manual is a first effort to begin to identify, describe, and develop procedures for assessing various aspects of digital reference service. Its overall purpose is to improve the quality of digital reference services and assist librarians to design and implement better digital reference services. More specifically, its aim is to:

- Assist librarians and others to develop ongoing programs of assessment of digital reference services.
- Provide a practical set of guidelines and procedures for how assessment of digital reference services can be done.
- Develop standardized procedures and definitions of statistics and measures that may be compared across different libraries.

Ultimately, we hope that this manual will assist librarians to better design and develop digital reference services in order to better meet user information needs.

As digital reference services develop, changes, revisions, and modifications of the content of this manual will also be needed. We especially expect significant advances to take place in the near future in the development of software that can automatically assist librarians to collect, manage, and analyze data describing digital reference services. Thus, the authors recognize that this manual is a first effort in the development of methods, statistics, and measures to assess digital reference. As a first effort we expect that others will be able to build from this work and extend it to be useful as digital reference services continue to expand and develop.

What this Manual is NOT

This manual is not a literature review of resources related to digital reference services. There are a number of such reviews available, one of which was done by the authors of this manual, *Assessing Quality in Digital Reference Services: Overview of Key Literature on Digital Reference* (Gross, McClure, and Lankes, 2001) and is available at: http://quartz.syr.edu/quality/VRDphaseII LitReviw.pdf. Other bibliographies related to digital reference services can be found at: http://quartz.syr.edu/quality/Reports.htm and http://www.lis.uiuc.edu/~b-sloan/digiiref.html (Sloan, 2002).

This manual is neither a practical guide to establishing a digital reference service, nor a discussion of issues related to the development and operation of digital reference services. Planning for and implementing digital reference services is a significant activity in and of itself. This manual assumes that the library has the digital reference services in place. A beginning source for such information has been written by Lankes, McClure, Gross, and Pomerantz (*Implementing Digital Reference Services: Setting Standards and Making it Real*, 2002). Other useful sources can be found in the literature reviews discussed above.

Finally, the manual is not a research methods text. The manual assumes that users will have a basic knowledge of research methods, statistics, data collection techniques, etc. Some especially useful research and data collection books include:

- Kruegar, Richard A. and Mary Anne Casey. 2000. *Focus Groups: A Practical Guide to Applied Research*. Thousand Oaks, CA: Sage Publications.
- Babbie, Earl. 2001. *The Practice of Social Research*. 9th edition. Belmont CA: Wadsworth Publishing.
- Rossi, Peter, Howard E. Freeman, and Mark W. Lipsey. 1999. *Evaluation: A Systematic Approach*. 6th edition. Thousand Oaks, CA: Sage Publications.

Clearly, there are numerous other titles available. These, however, can provide an excellent starting point for users of this manual who need additional background information in research methods and data collection/analysis techniques.

How to Use this Manual

The authors recommend various assessment methods, statistics, and measures throughout the course of this manual, and they are summarized in Figure 1.1. For ease of use, each statistic and measure has been described in terms of the following general categories:

Definition
Rationale
Data Collection Procedures
Issues and Considerations

For a number of the statistics and measures described here, additional detail on rationale, issues, and considerations could have been included given the situational nature of using this manual in different library settings. Since all situational considerations cannot be covered, the authors provide a general depiction and hope that this discussion will be of use to those implementing the statistics and measures.

Many of these procedures include data collection techniques that have long been used to assess services both in the field of library and information science and in the social sciences in general. These include: counting and tabulating of statistics, maintenance and analysis of manually kept transaction logs, sampling, surveys and questionnaires, interviews, and focus groups.

FIGURE 1.1 Summary of Measures, Statistics and Standards

Descriptive Statistics and Measures

1. Number of digital reference questions received
2. Number of digital reference responses
3. Number of digital reference answers
4. Number of questions received digitally but not answered or responded to by completely digital means
5. Total reference activity – questions received
6. Percentage of digital reference questions to total reference questions
7. Digital reference correct answer fill rate
8. Digital reference completion time
9. Number of unanswered digital reference questions
10. Type of digital reference questions received
11. Total number of referrals
12. Saturation rate
13. Sources used per question
14. Repeat Users

Log Analysis

15. Number of digital reference sessions
16. Usage of digital reference service by day of the week
17. Usage of digital reference service by time of day
18. User's browser
19. User's platform

User Satisfaction Measures

20. Awareness of Service
21. Accessibility of service
22. Expectations for service
23. Other sources user tried
24. Reasons for use
25. Reasons for non use
26. Improvements needed/Additional services that need to be offered
27. Satisfaction with staff service
28. Delivery mode satisfaction
29. Impact of service on user
30. User demographic data

Cost

31. Cost of digital reference service
32. Cost of digital reference service as a percent of total reference budget
33. Cost of digital reference service as a percent of total library or organizational budget

Staff Time Expended

34. Percent of staff time spent overseeing technology
35. Percent of staff time spent assisting users with technology

Other Assessment Options

Peer review
Enhanced reference transaction logs
Librarian discussion groups

Quality Standards

The manual incorporates the use of electronically generated logs and reports, which are available from software suppliers such as Webtrends, Webtracker, and similar digital reference software. Examples of these digital reports and logs and links to current software providers are included in this manual. Finally, other assessment options may be used, such as peer review, enhanced reference logs, and librarian discussion groups (see the section titled Other Assessment Options).

Throughout the course of the project Assessing Quality in Digital Reference, it became clear to the authors that, in many cases, digital reference services developed as a naturally evolving, "wouldn't this be great?" idea. Little formal planning or gathering of input from the potential users took place as the services evolved. The authors hope that this manual will assist those organizations who are thinking about starting or are in the initial planning stages of providing some type of digital reference (though this manual is not a planning manual), as well as those who are already providing digital reference. Thinking about the evaluation process and the data needed to conduct the evaluation prior to implementing the service significantly improves the evaluation effort.

Digital reference service is being provided in a variety of settings as illustrated above. The methods for providing digital reference (email, chat, instant messaging, integrated voice, interactive video, and specialized reference software) in each of these settings also vary. For example, email digital reference functions in a very different way than chat based digital reference software.

Thus, the statistics and measures, as presented here, are more general than specific and have been designed to be applied in a variety of settings or using a combination of methods. This manual does not provide detailed individualized assessment measures for each of the service provision methodologies used. Comments in the Data Collection Procedures and Issues and Consideration sections give general guidance with regard to applications in different digital reference contexts.

Individual libraries or organizations providing digital reference may not find all of these statistics and measures appropriate for their situation. Thus, users should choose those assessment statistics and measures that will be the most meaningful or relevant for a particular situation. Some of the measures may be easier to gather or more relevant than others, depending on setting and methods used. In some libraries it may not be possible to gather the data needed for a particular measure. In short, the manual is best seen as a menu of a range of possible statistics and measures from which users can select those most relevant and important for their particular setting.

Users of the manual will also recognize that some of the statistics have been modified from existing statistics of traditional reference services. The statistic "number of digital reference questions received," is based on traditional approaches. Other traditional statistics such as "reference transactions per capita" cannot be used in the digital environment unless the librarians have an accurate assessment of the population they intend to serve via the digital reference service. Thus, the statistics and measures described in the manual blend aspects of traditional approaches with new approaches that are especially appropriate for a digital environment.

Finally, in using this manual, keep in mind that useful evaluation can be done by employing only a small number of the statistics offered here. Do not attempt to immediately start up an evaluation effort and try to implement twenty to thirty of these statistics and measures. Select specific statistics and measures (probably no more than three to five on the first iteration) that will be especially relevant and important for the first assessment effort. Based on the results from this first assessment, then expand to collect additional data as appropriate, and as your experience and expertise grows.

Encouraging a Culture of Assessment

Findings from the site visits and field tests suggested that ongoing evaluation efforts in many libraries are not the norm. Lakos (1999, p. 5) defines a culture of assessment as:

> The attitudinal or institutional changes that have to occur in order for library staff to be able to work in an environment where decisions are based on facts, research and analysis, and services are planned and delivered in order to maximize positive outcomes and impacts for library clients.

For some library organizations that wish to begin an assessment program, significant preliminary preparation and planning may be needed.

In the experience of the authors, the primary constraints that may affect successful ongoing evaluation of services such as digital reference include:

- *Administrative support.* It is essential that top administration and those involved in the digital reference process are committed to conducting the evaluation, willing to commit resources to complete a successful evaluation, and will use the findings from the evaluation to improve the service.
- *The complexity of the service being evaluated.* For first-time evaluators, the authors recommend that they evaluate some specific aspect of digital reference, i.e., demographics of digital reference users, rather than the entire expanse of various aspects that constitute digital reference.
- *Staff skills and knowledge.* Those who will be involved in the evaluation effort should have basic skills and knowledge in research methods, development of data collection efforts, statistics and analysis of data, and reporting of findings in tables, charts, and visually pleasing figures. Staff may need training in these areas before conducting the evaluation.
- *Organizing staff for evaluation.* The library staff needs to be organized to conduct the evaluation. A person needs to be designated as the leader who will determine (either alone or with a team) how the evaluation should be done, a schedule for the evaluation, who will have what tasks, the types of statistics and measures to be collected, analyzed, and reported, etc.
- *Involvement of systems or information technology staff.* To successfully implement a number of the assessment techniques (log server analysis, online transaction log summaries, etc.) the direct involvement of library information technology staff is essential. Such a person should be part of the evaluation team or be actively involved in the evaluation effort.
- *Need to organize and manage data.* Once the data are collected they need to be organized, managed, and be made available for the long term. Timely reports need to be produced and targeted for specific user groups and administrators. Some type of database or management information system should be developed to house and manage the data for it to be used successfully in the future.

If these conditions are not present in the organization, ongoing evaluation of digital reference services will be difficult. Moreover, a culture of assessment suggests that library staff believe evaluation can improve services, that factual data provide an important tool that can be used to evaluate services, and that decisions and changes will, in fact, result from conducting the evaluation.

Library staff about to embark on evaluation of digital reference services should conduct an informal needs assessment to determine the degree to which the above conditions are present in the library and in staff. Based on that needs assessment, some initial time to insure that the conditions are present is a necessary investment before conducting the evaluation. The use of consultants to assist in preparing the library staff to engage in digital reference assessment or in assisting in the assessment itself may be appropriate. The success of the evaluation effort is as much a factor of the organization's readiness to conduct the evaluation, as is the use of the statistics and measures offered in this manual.

Get Over It!

The fact of the matter is that digital reference services will continue to grow and develop. To a large degree, the library community currently has limited knowledge and understanding of the costs, uses, users, use, and impacts of digital reference services. Evaluation of digital reference services is essential if the library community is to better understand how to best provide services in the networked, remote user environment. A critical ingredient to providing "best services" is ongoing assessment of digital reference services. Simply because the service is offered in a digital environment does not reduce librarian responsibility to assess that service.

To a large degree, libraries have seriously underrepresented their services in terms of use of digital services being provided and users of the services by not counting and assessing these uses and users. As more users rely on digital library services – including digital reference services – this undercount will continue to increase and will continue to inadequately describe the extent to which digital services are being provided. Thus, ongoing ability to describe digital references services and include these activities as part of overall library services is essential.

Digital reference and digital reference evaluation present a new range of challenges for librarians if they wish to prosper in the networked environment. When asked how librarians can cope with continued changes and the other stresses associated with digital reference services, McClure was quoted in a recent interview (Pierce, 2002, p. 45) as stating, "Get Over It." Digital reference is here to stay and the library profession needs to learn how to provide these services with high quality and high impact, and to be assured they are meeting user needs. The evaluation procedures outlined in the remainder of this manual should provide an important initial means for reaching that goal.

CHAPTER 2

DIGITAL REFERENCE STATISTICS, MEASURES AND STANDARDS

This chapter describes the various statistics and measures selected for inclusion in this manual. The chapter is divided into the following sections:

- Descriptive Statistics And Measures
- Log Analysis
- User Satisfaction Measures
- Cost
- Staff Time Expended
- Other Assessment Options
- Quality Standards

DESCRIPTIVE STATISTICS AND MEASURES

1. Number of digital reference questions received

Definition: A count of the number of digital reference questions received. A digital reference question is a question received electronically (e.g., via email, webform, digital interactive video, digital interactive voice, chat or digital reference software which incorporates any of the preceding methods) and which represents an information need that can be characterized as a single concept. To be considered a digital reference question, the question must be responded to and answered using digital means. Do not count any questions that may be received digitally but that are responded to with non-digital methods of communication. These questions should be included in *Measure 4 – Number of questions received digitally but not answered or responded to by completely digital means.* Do not include any questions that are received via phone, voicemail, face-to-face contact, fax, and regular postal mail. If more than one question is received in a single digital transmission (e.g. if a single email message, or chat session contains three reference questions), each question asked shall be counted as a separate question. The transmission itself shall not count as an additional question.

Rationale: This statistic is important for determining the volume of service. The numbers derived from this measure can be compared with the number of digital reference responses and digital reference answers to determine output. This statistic can also be compared to the total number of reference questions (of any type) received by a library or organization offering both traditional and digital reference service and can assist in the determination of appropriate staffing needs. A comparison of the varying types of digital reference services that might be provided by a single library or digital reference service (i.e., chat and email) could also be derived from this statistic. This statistic can assist in decisions regarding promotion of the service.

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff (using manual or electronically generated log or report or combination of two depending on situation).

Frequency: Logs are kept daily. Data is collected and tabulated in two-week periods and is generally reported annually unless required more frequently.

Procedures: Instruct staff on the definition of this measure as defined above. Inform staff of any special considerations they should take into account.

Continuous collection: Keep a record of the number of digital reference questions received daily, collect and tabulate every two weeks. Reporting is most frequently done on an annual basis.

Sampling: Select a typical two-week period. Keep a record of each digital reference question received on a daily basis (if using a manual log), or count the total number of reference questions received over the two-week period if using an electronic log. Manual analysis of electronic logs (generated for email, chat sessions, etc.) will be required to account for transmissions that may contain more than one digital reference question. Once data for the two-week period has been tabulated, extrapolate for the entire year based on the sample data. Collect data for sample two-week periods in various months throughout the year to account for periods of expected peak or diminished use.

For this measure count only those questions received digitally that are also responded to and answered digitally as defined in *Measure 2 – Number of digital reference responses* and *Measure 3 – Number of digital reference answers.*

Do not count as Digital Reference Questions Received any questions that are received digitally but which are responded to with non-digital methods of communication. These questions should be included in *Measure 4 – Number of questions received digitally but not answered or responded to by completely digital means.*

This measure should be used in conjunction with the following measures:

2 – Number of digital reference responses.
3 – Number of digital reference answers.
4 – Number of questions received digitally but not answered or responded to by completely digital means.
5 – Total reference activity – questions received.
6 – Percentage of digital reference questions to total reference questions.

Helpful tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.
I. Digital Reference Question Transaction Log – Email.
J. Digital Reference Question Transaction Log – Real Time Sessions.
K. Total Reference Activity Log – Daily / Two Week Period.
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: Depending on volume it can be time consuming to keep an accurate and detailed record of the number of reference questions received on a daily basis. Many libraries keep a manual tally sheet of the number of reference questions received (both traditional and digital), while other organizations will keep a sample log over the course of a brief period of time (such as a typical week or two at various times throughout the year) and then will project the count for the entire year. Some libraries utilize digital reference tracking software, while others use a combination of both manual and electronic logs. For those libraries offering digital reference using email or chat software, special attention and training should be given in recognizing the number of distinct reference questions received during a single session. Aggregating the numbers from these various sources (especially in situations where a library may be providing separate digital and traditional reference service) may require coordination of several staff members with attention given to consistency of counting methods and avoiding duplication of counts or omission of counts. Also of consideration when doing sampling is to account for periods of expected peak and diminished activity (such as summer and before finals in an academic setting, and holidays and summer for public library settings).

2. Number of digital reference responses

Definition: The number of digital responses refers to the number of digital contacts that are made with the user by staff in order to address a digital reference question as defined in *Measure 1 – Number of Digital Reference Questions Received.* Do not count as responses digital contacts initiated by the user. A digital response refers to any communication from the staff member to the user that is transmitted digitally. These digital contacts may occur via email, webform, interactive video sessions, interactive voice, chat or reference software. If more than one email message is sent to the user or more than one chat or real-time interactive video or voice session occurs in response to a digital reference question, each of these is counted as a separate response. Do not count the individual messages back and forth during a singe chat session as separate responses; each chat session counts as a single response. There may be more than one response to a single digital reference question. It should be noted that a digital response is not the same as a digital answer, i.e., a digital response to the user may or may not include the answer. A digital response may be a request for more information from the user, or may be a message asking if the digital answer sent was what the user expected. Do not include any responses that are sent to the user via phone, voicemail, face-to-face contact, fax, or regular postal mail.

Rationale: This fundamental statistic will indicate how many responses are sent in the process of trying to answer a digital reference question as defined above in *Measure 1 – Number of Digital Reference Questions Received.* This statistic can be used to analyze such factors as possible breakdowns in technology (effectiveness measure), effectiveness of the digital reference interview process, or the level of effort being expended in answering the question (efficiency measure).

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff (using manual or electronically generated log or report or combination of two depending on situation).

Frequency: Logs are kept daily. Data is collected and tabulated in two-week periods and is generally reported annually unless required more frequently.

Procedures: Instruct staff on the definition of this measure. Inform staff of any special considerations they should take into account.

Continuous collection: Keep a record of the number of digital responses made to each digital reference question received daily, collect and tabulate every two weeks. Reporting is most frequently done on an annual basis.

Sampling: Select a typical two-week period. Keep a record of the number of digital responses made to each digital reference question received on a daily basis (if using a manual log), or count the total number of responses made to each digital reference question received over the two-week period if using an electronic log. Some manual analysis of electronic logs (generated for email, chat sessions, etc.) will be required to determine the number of responses made to one question. Once data for the two-week period has been tabulated, extrapolate for the entire year based on the sample data. Collect data for sample two-week periods in various months throughout the year to account for periods of expected peak or diminished use.

This measure should be used in conjunction with the following measures:

1 – Number of digital reference questions received.
3 – Number of digital reference answers.
4 – Number of questions received digitally but not answered or responded to by completely digital means.
5 – Total reference activity – questions received.
6 – Percentage of digital reference questions to total reference questions.

Helpful tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.
I. Digital Reference Question Transaction Log – Email.
J. Digital Reference Question Transaction Log – Real Time Sessions.
K. Total Reference Activity Log – Daily / Two Week Period.
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: Depending on volume it can be time consuming to keep an accurate and detailed record of the number of digital reference responses provided on a daily basis. Recording this statistic will require that, after each question is answered, the staff member record whether the question was responded to or answered entirely through electronic means, as defined above, or if the responses or answer were provided via traditional means or a via a combination of traditional and digital responses. Another area for consideration is if more than one staff member contributes to the answering of a question. Additionally, some libraries only keep a tally sheet of questions received and not of questions answered (either through traditional or digital means) or of responses made because they have previously not been required to keep track of the these statistics. This new procedure of detailed tracking of the number of digital responses will require additional training and understanding of the concepts involved. It will also involve additional time.

3. Number of digital reference answers

Definition: A digital reference answer provides the information that the user is seeking for their digital reference question. For the purposes of this manual, the aggregate of electronic responses made to a single digital reference question as defined in *Measure 1 – Number of Digital Reference Questions Received* shall count as single digital reference answer. This aggregate must include at least one of the following: a) communication with the user that provides an actual specific answer to the reference question (i.e., actual content related to the subject of the question); b) directions to resources that may help the patron locate the answer on their own (as often occurs in digital reference); or c) a referral to another contact point, either external or internal, as defined in *Measure 11 – Total Number of Referrals*. Do not count as a digital reference answer any aggregate of responses that does not provide content that directly addresses the user's information need, does not provide specific directions to the user about resources that may help them locate the answer on their own, or is not a referral. Do not count as a digital reference answer the aggregation of a series of responses that ask the user for more information yet are never responded to (user evaporation) or a series of responses that result in the user not receiving the information they need. Do not count as a Digital Reference Answer any answer that is provided to the user digitally, but which may have been preceded by a non-digital response. (For example, the question may have been received digitally and the answer provided digitally, but the staff member may have called the user for more information.). Again, for any digital reference transaction to be counted as digital, each component of the transaction (i.e., the question, responses, and answer) must be transmitted digitally.

Rationale: A digital reference answer as defined above will be useful in determining how many digital reference questions received actually have an answer provided to the user. For the purposes of this manual an answer can also include a referral. This statistic will be useful when completing other measures such as *Measure 8 – Digital Reference Completion Time*, and the User Satisfaction Measures, which relate to users' perceptions regarding various aspects of their answer. This measure can assist in collection and staff development decisions if the ratio of answers to questions is low.

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff (using manual or electronically generated log or report or combination of two depending on situation).

Frequency: Logs are kept daily. Data is collected and tabulated in two-week periods and is generally reported annually unless required more frequently.

Procedures: Instruct staff on the definition of this measure. Inform staff of any special considerations they should take into account.

Continuous collection: Keep a record of the number of digital reference answers provided daily, collect and tabulate every two weeks. Reporting is most frequently done on an annual basis.

Sampling: Select a typical two-week period. Keep a record of the number of digital reference answers provided on a daily basis (if using a manual log), or count the total number of answers made to each digital reference question received over the two-week period if using an electronic log. Some manual analysis of electronic logs (generated for email, chat sessions, etc.) will be required to determine the number of digital reference answers. Once data for the two-week period has been tabulated, extrapolate for the entire year based on the sample data. Collect data for sample two-week periods in various months throughout the year to account for periods of expected peak or diminished use.

Again, count the collection of these responses as one answer. Do not count as a digital reference answer any responses sent to the user asking for more information if such a request is never responded to by the user (these will be counted in *Measure 9 – Number of Unanswered Digital Reference Questions*). Also, do not count as a digital reference answer any aggregation of responses that include any form of communication with the user that is not considered digital. For example, if during the course of the reference transaction a telephone or face-to-face conversation takes place, the answer will not be considered a digital reference answer even if the question was submitted digitally.

This measure should be used in conjunction with the following measures:

1 – Number of digital reference questions received.

2 – Number of digital reference responses.

4 – Number of questions received digitally but not answered or responded to by completely digital means.

5 – Total reference activity – questions received.

6 – Percentage of digital reference questions to total reference questions.

Helpful Tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.

I. Digital Reference Question Transaction Log – Email.

J. Digital Reference Question Transaction Log – Real Time Sessions.

K. Total Reference Activity Log – Daily / Two Week Period.

M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: A review of the literature and research that has sought to arrive at a consistent and meaningful definition of what constitutes an "answer" to a reference question (either digital or traditional) has shown that such a definition is elusive. Because of the difficulty in defining what exactly is meant by the term "answer," and because the patron's definition of answer may not match the definition given here, collection of this measure will require careful scanning of the responses made to the user and thoughtful analysis. This will be especially so for the more complex reference questions. When doing this analysis, such questions as "Do we count partial answers?" and "How do we know when the answer is complete?" may arise. Consistency in how these questions are answered will be important in collecting the statistics for this measure. Providing an answer to a user's digital reference question is the primary reason that a reference service exists, and while this statistic may be more difficult to collect it is also one of the most important.

4. Number of questions received digitally but not answered or responded to by completely digital means.

Definition: This measure refers to those reference questions that are received digitally but have been responded to and/or answered either with traditional methods or using a combination of both digital and non-digital communication methods. NOTE: For the purposes of this manual, the number gathered for this measure shall not be included in the count of *Measure 1 – Digital Reference Questions Received* but shall be counted here as a separate measure.

Rationale: In many cases, questions that are received digitally are responded to using a combination of methods, some digital and some not. This is especially true of those libraries that provide a combination of both traditional and digital reference service. For example, a question received via email may warrant a response that includes a phone call to the user for more information, sending a book to the user via a branch library, or faxing a required article in addition to sending an article electronically. In many cases, these types of transactions comprise a significant portion of the transactions that take place in a library. This measure, while not meeting the strict criteria as a digital reference question as defined in this manual (i.e. must be responded to and answered by completely digital means), will allow for an additional point of comparison between digital reference and traditional reference and will also allow for recognition of what, in some cases, may be a significant portion of reference activity. This will give a better overall picture in situations where both traditional and digital reference service are provided. This measure will be useful in making staffing, training, and collection development and operating expense decisions. For example, if there is a large number of these type of questions, staff will need to be familiar with both traditional and digital resources, and will need to make decisions about the best resource to answer the question and the best way to respond to the patron. Staff may need training in how to use both traditional and digital resources. Collection development decisions can include whether to buy print or digital resources or both. Allocation of operating expenses can include deciding whether additional voice phone lines, fax machines, and workstations for email service are needed. Libraries offering reference service that simultaneously provides both digital and traditional methods must necessarily look closely at the reference service as a whole, and this measure will help provide a clearer picture of the relative proportions of the various aspects of the service that they provide.

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff (using manual or electronically generated log or report or combination of two depending on situation).

Frequency: Logs are kept daily. Data is collected and tabulated in two-week periods and is generally reported annually unless required more frequently.

Procedures: Instruct staff on the definition of this measure and correct procedures. Inform staff of any special considerations they should take into account.

Continuous collection: Keep a record of the number of digital reference questions received but not answered or responded to by digital means daily. Collect and tabulate every two weeks. Reporting is most frequently done on an annual basis.

Sampling: Select a typical two-week period. Keep a record of the number of digital reference questions received but not answered or responded to by digital means on a daily basis. Analysis of manual and electronic logs (generated for email, chat sessions, etc.) will be required. Once data for the two-week periods has been tabulated, extrapolate for the entire year based on the sample data. Collect data for sample two-week periods in various months throughout the year to account for periods of expected peak or diminished use.

This measure should be used in conjunction with the following measures:

1 – Number of digital reference questions received.

2 – Number of digital reference responses.

3 – Number of digital reference answers.

5 – Total reference activity – questions received.

6 – Percentage of digital reference questions to total reference questions.

Helpful Tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.
I. Digital Reference Question Transaction Log – Email.
J. Digital Reference Question Transaction Log – Real Time Sessions.
K. Total Reference Activity Log – Daily / Two Week Period.
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: It is acknowledged by the authors that in many situations questions received digitally may not be responded to and/or answered digitally. For example, a question may be sent via email, but the staff member may call the patron on the phone for clarification or may need to fax an article to the patron. This measure addresses and gives credit for those hybrid-type reference transactions and will be helpful for those libraries or services that provide a combination of reference services. It may be less useful to those digital reference services that are strictly designated as such and are not part of a larger library service.

5. Total reference activity – questions received

Definition: Total reference activity refers to the total number of reference questions received and will be calculated by adding the number of digital reference questions received (*Measure 1 – Digital Reference Questions Received*), the number of questions received digitally but not responded to with completely digital means (*Measure 4 – Number of questions received digitally but not answered or responded to by completely digital means*) to reflect hybrid transactions, and the number of traditional reference questions received.

DQR + HQR = TQR

Rationale: Libraries are increasingly providing both separate traditional and digital reference services or in many cases a combination of both, and it is useful to know what the total reference activity is as defined by the total number of reference questions received. This statistic will be useful in assessing the total reference service provided to users in the context of all library services and can be beneficial in long range planning.

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff (using manual or electronically generated log or report or combination of two depending on situation).

Frequency: Logs are kept daily. Data is collected and tabulated in two-week periods and is generally reported annually unless required more frequently.

Procedures: Instruct staff on the definition of this measure as defined above. Inform staff of any special considerations they should take into account.

Continuous collection: Keep a record of the total number of reference questions received (traditional, hybrid and digital) daily, collect and tabulate every two weeks. Reporting is most frequently done on an annual basis.

Sampling: Select a typical two-week period. Keep a record of each reference question received (traditional, hybrid and digital) on a daily basis using both manual and electronic logs. Some manual analysis of electronic logs (generated for email, chat sessions, etc.) will be required to account for transmissions that may contain more than one digital reference question. Once data for the two-week period has been tabulated, extrapolate for the entire year based on the sample data. Collect data for sample two-week periods in various months throughout the year to account for periods of expected peak or diminished use.

Add the number of digital reference questions received, the number of reference questions received which are not responded to entirely through digital means, and the number of traditional reference questions received.

In some cases, digital reference staff may need to coordinate with the staff providing traditional or integrated reference service if the services are separate in the library.

If sampling is the chosen method of collection for this measure, coordination will also be required so that sampling periods for traditional or integrated reference service coincides with the sampling periods for the digital reference service.

This measure should be used in conjunction with the following measures:
1 – Number of digital reference questions received.
2 – Number of digital reference responses.
3 – Number of digital reference answers.
4 – Number of questions received digitally but not answered or responded to by completely digital means.
6 – Percentage of digital reference questions to total reference questions.

Helpful Tools – See Appendix I for:
I. Digital Reference Question Transaction Log – Email.
J. Digital Reference Question Transaction Log – Real Time Sessions.
K. Total Reference Activity Log – Daily / Two Week Period.
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: This measure will be of more use to those libraries providing a combination of reference services (i.e., both traditional and digital). Keeping track of the number of reference questions received by either traditional or digital means on a daily basis is time consuming. Determining which category each reference transaction falls into will require manual analysis of each transaction. Many libraries utilize a sampling methodology where they keep a sample log over the course of a brief period of time (such as a typical week or two at various times throughout the year) and then project the count for the entire year. Other libraries utilize digital reference tracking software. Some use a combination of both manual and electronic logs. Aggregating the numbers from these various sources may require coordination of several staff members with attention required to consistency of counting methods and avoiding duplication of counts. Also of consideration when doing sampling is to account for periods of peak and lesser activity (such as summer and before finals in an academic setting, and holidays and summer for public library settings).

6. Percentage of digital reference questions to total reference questions.

Definition: A percentage of the number of digital reference questions received to total number of reference questions received. The digital reference question must be received electronically (e.g., via email, WWW form, interactive video, interactive voice, chat, reference software) and answered and responded to digitally as defined in *Measure 1 – Number of digital reference questions received.* The number of total reference questions received is obtained in *Measure 5 – Total Reference Activity – Questions Received.*

$$\frac{\text{Digital Reference Questions Received}}{\text{Total Reference Questions Received}} \times 100$$

Rationale: Because most libraries operate on limited funding and must allocate their resources carefully, it is critical for sound library management that the percentage of digital reference questions received be compared to the total number of reference questions received. This percentage can then be used in making both short term management and long range planning decisions. For example, if 80% of a library's reference staff is dedicated to the provision of traditional reference service while 70% of the reference questions received are received digitally, serious consideration must be given to why this is so and how the situation should be managed. Does more staff need to be devoted to the provision of digital reference service if the service is separate from the traditional service? In cases where the same staff members provide both digital and traditional reference, does more staff training need to be provided? Do more electronic resources need to be purchased? Conversely, if a library is committed to the provision of digital reference service and allocates a large percentage of the budget to the provision of digital reference yet only 15% of the questions received are received digitally, an analysis must be made to determine if the digital reference service is something the user population needs at the level to which it has been funded or if the service has been advertised adequately.

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff (using manual or electronically generated log or report or combination of two depending on situation).

Frequency: Reported annually, though logs are kept on a daily basis and collected and tabulated on a per week basis.

Procedures: Instruct staff on the definition of this measure. Inform staff of any special considerations they should take into account.

Continuous collection: Keep a record of reference questions received daily, tabulate every two weeks. Reporting is most frequently done on an annual basis.

Sampling: Select a typical two-week period, keep a record of all digital reference questions received on a daily basis, then extrapolate based on the sample data. Collect data for sample two-week periods in various months throughout the year to account for periods of peak or diminished use.

Divide the total number of digital reference questions received by the total number of reference questions received and then multiply by 100.

For this measure the digital reference staff will need to coordinate with the staff providing traditional reference service if the services are separate in the organization.

Coordination will also be required so that sampling periods for traditional reference service coincide with the sampling periods for the digital reference service if sampling is the chosen method of collection for this measure.

This measure should be used in conjunction with the following measures:

1 – Number of digital reference questions received.
2 – Number of digital reference responses.
3 – Number of digital reference answers.
4 – Number of questions received digitally but not answered or responded to by completely digital means.
5 – Total reference activity – questions received.

Helpful Tools – See Appendix I for:

I. Digital Reference Question Transaction Log – Email.
J. Digital Reference Question Transaction Log – Real Time Sessions.
K. Total Reference Activity Log – Daily / Two Week Period.
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: This measure will be most useful for those libraries providing a combination of reference services (i.e., digital and traditional). Again, keeping track of the number reference questions received on a daily basis can be time consuming. One method for measuring the number of reference questions received is to pick a short time period (a week or two), which represents a typical period of use for the service, to accurately measure for that time period and to then project the count over the course of the year. Peak periods and periods of less use should also be taken into account when projecting the count. Another consideration with this measure is in carefully determining how the data will best be used.

7. Digital reference correct answer fill rate

Definition: Digital reference correct answer fill rate is the ratio of correct answers given to total answers given.

$$\frac{\text{Correct Digital Reference Answers}}{\text{Total of Digital Reference Answers}} \times 100$$

Rationale: With any library service it is important to determine if the service is accomplishing its stated goals. In the provision of any reference service (either traditional or digital) one of the most fundamental and logical goals is that correct answers be given to the reference questions received. Indeed this measure should be one of the keystones in assessing the quality of digital reference. A review of library literature on the provision of correct answers to reference questions has shown that in many cases the provision of correct answers to reference questions occurs less frequently than would be expected of a quality reference service. Other literature has shown that correctly answering reference questions using the Internet is equal to or exceeds the provision of correct answers to reference questions using traditional resources. The information gathered from this measure can be crucial in making collection development decisions (Are the resources being used outdated or not updated frequently enough? Are the resources needed to answer such questions available to staff? Are the resources reputable?), negotiating contracts with database vendors, and developing continuing education programs for staff members.

Data Collection Procedure:
Peer Review.
Unobtrusive testing.
Independent analysis of answers by outside observer.

Collected by: Management or supervisor.
Frequency: Annually (at least minimally) or more frequently if necessary or useful.
Procedures:

Peer review: Periodically, staff members review case studies of actual reference transactions that occurred over a defined period of time, (the previous two weeks for example), in which answers were provided to digital reference questions. All identifying information must be removed regarding both the user and the staff members who handled the question. The goal is to assess whether the question was answered in the best way possible and to share suggestions for improvements or additional resources that could help to answer similar questions in the future. The peer review group reaches consensus regarding the "correctness" of the answer provided. This method is useful in assessing quality and correctness in those questions that may be more complex than the simple ready reference question (though this method could also be used for those types of questions).

Unobtrusive testing: A set of quick fact ready reference questions with predetermined known answers are submitted to the digital reference service without the staff members knowing that these questions are part of the assessment process. A supervisor, manager or outside assessor reviews the answers received. An analysis of the answers given is used to calculate the correct answer fill rate.

Independent analysis of answers by outside observer: Periodically an outside analyst or team of analysts reviews answers provided to digital reference questions over a given period of time. Identifying information regarding staff members who handled the questions is removed before the analysis period. The outside analysts assess whether each answer given was "correct" or "incorrect" and the correct answer fill rate is calculated. The data is then given to the manager or supervisor.

Helpful Tools – See Appendix I for:
H. Sample Digital Reference Transaction Record.
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: When a user submits a question to a digital reference service he or she is expecting to receive a correct answer. In fact, the provision of a correct answer is one of the most important determinants in assessing quality in digital reference (or any other type of reference service). For many ready reference type questions (which, in many cases, are the only type of questions answered by a digital reference service) it is expected that giving the correct answer would be relatively easy and that the correct answer fill rate would be high. However, decades of research have shown that this is not necessarily the case. Determining whether an answer is "correct" or not becomes even more difficult for more complex types of questions (such as in-depth research questions, literature reviews, etc.).

Staff and management alike may be resistant to the idea of being tested on the correctness of the answers they provide to their users and there may be union restrictions regarding such testing. However, such testing, if done in a sensitive, constructive, and non-threatening manner can be extremely useful for a number of reasons. The data gathered from this measure can bolster staff members' contentions that newer resources are needed or that they would like training in a particular subject area.

Sharing of knowledge through the peer review process can provide an opportunity for displaying areas of expertise or interest that staff members may have. Unobtrusive testing, while admittedly limited in the types of questions and answers it can address, provides for the most realistic assessment of "correct" answers.

It is the authors' firm belief that, though there may be resistance from staff and managers alike, determining the correct answer fill rate is an essential measure for assessing quality in the provision of digital reference.

8. Digital reference completion time

Definition: Digital reference completion time refers to the average time that it takes to provide a digital reference answer to a digital reference question. This measure is often referred to as turnaround time.

Rationale: How long it takes to provide an answer to a digital reference question is a crucial factor when assessing the quality of any reference service. This measure can be used to determine if answers are being provided in a timely manner and can also be used to set policy for expected turnaround time for the service based on the resources available.

Data Collection Procedure: Sampling.

> ***Collected by:*** Staff (using manual or electronically generated log or report or combination of the two depending on situation).
>
> ***Frequency:*** Logs are kept daily. Data is collected and tabulated in two-week periods and is generally reported annually unless required more frequently.

Procedures: Instruct staff on the definition of this measure. Inform staff of any special considerations they should take into account.

> ***Sampling:*** Select a typical two-week period, keep a count on a daily basis, collect and tabulate for selected sample two-week period, and then extrapolate based on the sample data. Collect data for sample two-week periods in various months throughout the year to account for periods of peak or diminished use.

Count only those questions that are both initiated and completed in the same two-week period.

On the reference log, staff should note the date and time that the digital reference question was sent by the user (for email and web submission form) or the date and time the initial contact was initiated by the user of real time services (via chat, interactive voice or video, or digital reference software). The log should also note the date and time that the initial response was made by the service staff to the user, and the date and time that the final response was sent to the user. Only count the time if an answer or referral was actually provided to the user.

The units of measurement should be counted in minutes, hours and days (or any combination) depending on the type of service that is provided and the needs of the particular service. The time that has transpired for each transaction is measured and at the end of the sample two-week period the average is calculated. Include all time that transpires between the submission of the question and the final response.

Over the course of the two-week sample period there may be one or two transactions (either real time or chat) that take much longer than others and thus may not present a realistic view of the average. An analysis of the median and distribution in such cases may give a more accurate picture of the completion time or turnaround time for the service.

NOTE: Do not subtract time that the staff members may not have been working on the question, working on other questions or on break. All time that has elapsed should be counted regardless of the time that was actually spent on the specific question.

Helpful Tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.
I. Digital Reference Question Transaction Log – Email.
J. Digital Reference Question Transaction Log – Real Time Sessions.
L. Digital Reference Completion Time Calculation Worksheet.
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: Again, it may be time consuming and difficult to provide the level of detailed record keeping this measure requires on a daily continuous basis and it is recommended that a typical sample period (two weeks) be measured. Some may feel that this measure does not assess the actual time spent working on the question. In many cases, staff members may be interrupted, may be working on more than one question at a time, may take breaks or lunch or even go home for the night before completing a question. Also, more than one staff member may be working on the same question. The authors, advisory committee, and field testers felt that it might be difficult for some libraries to record every time staff members started and stopped working on question at such a detailed level. If a library or service has the capacity and resources to provide this level of detail they are encouraged to do so as a separate measure, but it should be noted that the primary purpose of this measure is to determine from the user's perspective how long it took for his or her question to be answered. It should not be assumed that a quick turnaround time is always the most desirable outcome. In situations where the question is complex or the user expects a comprehensive answer, a longer turnaround time may be a better indicator of quality than a shorter one. Also, strict emphasis on turnaround time may cause the staff to sacrifice quality reference interviews and appropriate follow-up and may also encourage inappropriate referrals. This measure should be closely looked at and analyzed with sensitivity and thought.

9. Number of unanswered digital reference questions

Definition: An unanswered question is a digital reference question for which no answer (as defined in *Measure 3 – Number of Digital Reference Answers*) is sent by the service to the user. Include in this count any "incomplete" reference transactions. An incomplete digital reference transaction is defined as a reference transaction in which a request for further information sent by the staff to the user in response to digital reference question results in no further communication on the part of the user. This phenomenon is referred to in the literature as "user evaporation" (January 18, 2002 coined by Joe Janes at ALA Mid-Winter 2002 Conference in New Orleans for the ACRL Program *Digital Reference: Trends, Techniques and Change*). Also include any questions that have not been answered because of capacity issues (i.e., not enough staff available to answer the question in the required time or not enough resources). Finally include any questions that may have no answers, or any questions that may have "slipped through the cracks" due to technical or human error (for example a question was sent but no response whatsoever was made by the staff to the users). Do not include in this count any questions for which a referral (either internal or external as defined in *Measure 11 – Total Number of Referrals*) is made. A referral is counted as a digital reference answer as defined in *Measure 3 – Number of Digital Reference Answers* above.

Rationale: A count of unanswered digital reference questions can help determine if the capacity of the service is adequate. This statistic can also assist in assessing the quality of the communication skills of the staff. An analysis of the unanswered reference questions can determine if the number of technical problems or human errors is excessive, or if expectations of the users are realistic or unrealistic (as in the case of unanswerable questions). In addition, this count can be compared to the total number of digital reference questions received and/or the total number of digital reference questions answered to derive ratios such as:

"Unanswered digital reference questions" to "Total reference questions"

"Digital reference questions" to "Digital reference answers."

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff, manager or supervisor.

Frequency: Logs are kept daily. Data is collected and tabulated in two-week periods and is generally reported annually unless required more frequently.

Procedures: Inform staff of the correct definition of this measure. A designated staff person, manager, or supervisor collects and reviews the logs after a given period of time and analyzes them to determine if there are any unanswered questions as defined above.

Continuous collection: Logs are kept daily. Data is collected and tabulated every two weeks and is generally reported annually unless required more frequently.

Sampling: Select a typical two week period, keep a count on a daily basis, collect and tabulate for selected sample period and then extrapolate based on the sample data. Collect data for sample two-week periods in various months throughout the year to account for periods of peak or diminished use.

Helpful Tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.

M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: Determining the number of unanswered digital reference questions will require keeping a log (either manual or with digital reference software) and a periodic analysis of this log by supervisors or staff or a peer review group. Another issue is when to decide that a question is unanswered (especially if the unanswered question is the result of an incomplete reference transaction). Libraries may set a specific time after which a question is designated unanswered. For example, if no answer is provided within 3 or 4 days the question may be considered unanswered. This designated time period may depend largely on the type of digital reference question (*Measure 10 – Type of Digital Reference Question Received*).

10. Type of digital reference questions received

Definition: Type of reference question refers to the categorization of each reference question as one of the following: Bibliographic, Instructional, Literature Search, Other, Out of Scope, Reader's Advisory, Ready Reference, Research or Subject Request, and Technical. These are defined as follows (definitions are also included in the Glossary):

Bibliographic
A bibliographic reference question is one that relates to any aspect of authorship or publication of a work. Bibliographic reference queries can include verification of a citation, names of authors, information about works in a series, edition information or copyright information, etc.

Instructional
An instructional question is one in which the user asks for assistance in using electronic resources that may be available to them and that may provide the answer to another reference question. Examples of instructional questions include requests for information on how to construct a search statement in an online periodical database, how to search the online catalog (OPAC), how to request books and other materials from the catalog, how to limit searches by domain in a particular search engine, and how to use Boolean Logic.

Literature Search
A literature search is a request for all of the published literature on a given topic or by a given author. The literature search may be limited by such factors as date, place of publication, peer-reviewed journals only, etc.

Other
For the purposes of this manual, "other" refers to those questions that are within the scope of the service but do not fit into any of the other categories. Digital reference questions that fit more than one category should be classified as "other."

Out of scope
An out of scope question is one that will not be answered by the digital reference service because it does not meet the criteria set by the service for provision of an answer. Out of scope questions are often referred to another service within the organization or to an outside agency or service.

Reader's Advisory
A reader's advisory question refers to requests for information regarding material the user would like to read. Reader's advisory questions often take the form of asking for similar books by plot, other books by an author, other books in a series, availability of works in a specific format (e.g., large type, book on CD or tape), works in a particular language, or information about the background of a particular book.

Ready Reference
Ready reference (or quick fact) questions are those that usually have a single, finite answer. The answers can generally be found in common reference works such as almanacs, encyclopedias, directories, dictionaries, atlases, thesauri, and factbooks. Some examples of ready reference questions include: What is the population of Indonesia? What is the capital of Brazil? On what date did Queen Victoria die? How do you spell "symbiotic"? It should be noted that many digital reference services will only answer ready reference type questions.

Research or Subject Request
A research question is one in which the user requests a variety of information on a particular topic. The research question will most likely have many components to the answer (i.e., articles from journals, books, citations, essays, statistics, raw data) and the answer may consist of responses sent in many formats (emailing of full-text articles or citations, pushing websites, documents or spreadsheets, image files, video clips, etc.).

Technical
A technical question is defined as a reference question in which the user asks for assistance in the use of the technology required to access the digital reference service or other aspects of accessing the library's or organization's website. These questions can include: How do I download Adobe Acrobat Reader? How do I open attachments? How do I install chat software?

Rationale: Knowing what types of questions are asked through the digital reference service will assist in making collection development decisions regarding the acquisition of electronic and print (if used) reference resources. Having an accurate assessment of the type of reference questions asked will also impact decisions regarding assignment of staff in answering digital reference questions based on their area of expertise or specialization. Additionally, a clear understanding of the types of reference questions asked can assist in the design of the reference service components. For example, if many questions are ready reference type or repeat questions with simple answers, a frequently asked questions (FAQ) web page may be developed, or an archive of previously asked questions could be mounted. If a number of bibliographic questions are asked, more bibliographic resources may be needed. If technical questions about how to use the electronic resources are frequently asked, then a staff member who excels in giving step-by-step instruction or who understands Boolean logic may be called upon to answer such questions. Analysis of technical questions may also result in modifications, improvements and upgrades to the system.

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff and manager or supervisor.

Frequency: Logs are kept daily. Data is collected and tabulated in two-week periods and is generally reported annually unless required more frequently.

Procedures: Staff will be instructed in the proper classification of digital reference questions by type, which will include the following categories (See above or glossary for definitions):

- Bibliographic
- Instructional
- Literature Search
- Other
- Out of Scope
- Reader's Advisory
- Ready Reference
- Research or Subject Request
- Technical

Continuous collection: Upon receipt of each digital reference question, staff will determine what type of question it is based on the definitions above. Staff will record the type of question received in the reference transaction log. Every two weeks the data will be collected or tabulated by type of digital reference question received.

Sampling: A typical two-week period is selected and each digital reference question received is assigned a type based on the categories above. The data is tabulated and collected at the end of the two-week period and the results are extrapolated for the rest of the year. It is recommended that sampling be done several times throughout the year and that considerations be given to time periods of peak and diminished use.

NOTE: If a digital reference question can be classified in more than one category, count the question in the "other" category.

Helpful Tools – See Appendix I for:
H. Sample Digital Reference Transaction Record.
N. Type of Digital Reference Question Received.

Issues and Considerations: This measure requires that a detailed record be kept of the type of reference questions asked and that each question be assigned to a particular category. Some questions may have multiple type responses or may not fit one of the defined categories. These questions should be designated as "other." Commercial reference tracking software may not include these categories for easy collection. Manual logs may need to be developed to incorporate this component. Additionally, because of the time consuming nature of tabulating this information, a sample period may be measured. One of the drawbacks of sampling is that an accurate assessment may be missed due to certain types of questions being asked at certain times of the year. This may be particularly true in an academic setting where there may be more bibliographic and instruction type questions at the beginning of a semester due to the arrival of new students and more research type questions toward the end of the semester when papers are due. To some extent these same fluctuations may be apparent in a public library setting. Increasingly, many public library users are K-12 students or college students who are participating in distance learning programs and rely on their public libraries because they do not have physical access to their college resources. Any sampling should take into account these variations.

11.Number of referrals

Definition: The number of referrals is a count of the number of users who have been referred to another internal contact point within the library or digital reference service (e.g., the regular reference desk or special section of the library such as genealogy, local history, government documents) or to an external contact point (e.g., another library or outside agencies such as governmental departments, medical or health facilities, legal organizations). The referral can be made for a number of reasons: non-affiliated users, inappropriate question for service (e.g., service only answers ready reference type questions) or the lack of resources necessary to answer the question. Do not count as a referral information provided to the user regarding possible resources, such as electronic databases or websites, which the user can access to find the answer to the question independently. Providing this kind of information to the user is counted as a Digital Reference Answer as defined in *Measure 3 – Number of Digital Reference Answers*.

Rationale: The number of referrals is an important measure that can be used to assist in collection development. If a lot of referrals are being made, it may mean that the collection (either print or electronic) that is at the disposal of the staff is inadequate. This measure can also help with planning in terms of the scope of service offered. In the case of internal referrals, this measure can also be used to determine staffing needs for the digital reference service and for other departments to which the referrals have been made (e.g., traditional reference, technical services, bibliographic or computer training instruction within the library). In addition, an analysis of the external referrals may provide opportunities for cooperation and collaboration with other libraries, agencies, or organizations.

Data Collection Procedure: Continuous collection or Sampling.

Collected by: Staff and manager or supervisor, electronically generated transcripts.

Frequency: Logs are kept daily. Data is collected and tabulated in two-week periods or monthly periods and is generally reported annually unless required more frequently.

Procedures: Instruct staff on the definitions of internal and external referrals and correct procedures for logging the referral. Inform staff of any special considerations they should take into account.

Continuous collection: Logs are kept daily or transcripts are utilized if available. Data is collected and tabulated every two weeks or monthly, and is generally reported annually unless required more frequently.

Sampling: Select a typical two-week period or monthly period, keep count on a daily basis and then extrapolate based on the sample data. Collect data for a sample two-week period or monthly period at various times throughout the year to account for periods of peak or diminished use.

This measure should be used in conjunction with the following measures: *3 – Number of Digital Reference Answers.*

Helpful Tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.

M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: Keeping track of the number of referrals will require the maintenance of a manual log to tally the number of referrals and to reflect whether the referral was internal or external. Electronically generated transcripts can also be used if available. In either case, careful analysis of the number and nature of referrals is crucial. It is also important to get a sense of why the question was referred and specifically where within the internal or external referral network the user was referred. This level of detail will require more diligence and effort on the part of the staff member keeping the log. Another issue is determining whether the referral resulted from the digital reference service not having the resources that they should be expected to have as compared to possible misunderstanding by the user about what services the digital reference service can provide. This analysis may result in very different management decision and actions. For example, if the user submits a complex reference question and is referred to the traditional reference service because the scope of the digital reference service has been defined as only the provision of ready reference, the managerial response may be to alter the advertising of the service to make this limitation clear. If a question is submitted that is within the scope of the service, but a referral is made because the service has no resources to answer the question, the issue becomes one of collection development and perhaps reallocation of resources. Finally, referrals may be made when the question could have been answered by the digital reference service. This could indicate a need for more training or that there is not enough staff to handle the workload. The level of detail kept in the log may help to determine if this is the case.

12. Saturation rate

Definition: The saturation rate is the measure of the ratio of digital reference service users who are members of the target population to the total number of members of the target population.

$$\frac{\text{Total digital reference service users*}}{\text{Total number of target population}} \times 100$$

*who are members of target population

To calculate this measure it is first necessary to determine the number of digital users and the population of the target group.

Rationale: Saturation rate is an important measure that reflects how many members of the given target population actually use the digital reference service. This percentage can assist in decision-making processes regarding advertising of service, importance of service to the target population, and subsequent allocation of resources to the digital reference service.

NOTE: Some libraries may not be able to complete this measure as they may be unable to determine the total number of members in the target population group.

Data Collection Procedure: Other: demographic analysis.

Collected by: Manager or Supervisor.
Frequency: Monthly or annually.
Procedures: Determine the total number of users of the digital reference through an analysis of the logs. Determine the target service population. Divide the total number of digital reference users who are part of the target service population, by the total target population and multiply by 100.

Helpful Tools – See Appendix I for:
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: Determining the target population may be relatively simple as in the case of an academic setting in which the target population is the faculty, staff, and students of the college, school or university, or in a public library setting where the "chartered to serve" area and population are clearly defined and accurately match the actual service area in practice. It may be more difficult to determine the target service population in cases where the digital reference service is strictly virtual and the target population is so vast or ephemeral as to be not useful, or in a public library setting in which the chartered to serve population area is not clearly defined and does not match the actual service area in practice. Also, it may be difficult to determine if an actual user is, in fact, part of the target population. Again, some libraries may not be able to complete this measure as they may be unable to determine the total number of members in the target population group.

13. Sources used per question

Definition: This statistic will identify each of the resources used in responding to a digital reference question and will include but not be limited to such resources as: full-text and citation/abstract databases; statistical databases; directories; bibliographic resources; electronic reference books and encyclopedias; e-journals and e-text subscriptions; image archives; local and regional OPACs and consortial catalogs (such as OCLC's WorldCat) and aggregate databases that can include all of the above (such as Dialog and Lexis-Nexis, OCLC's FirstSearch); webpages and other internet resources; newsgroup resources; listserv resources; and scanned resources transmitted electronically. Also include here traditional (print-based) resources that are used to answer questions, so long as the answer obtained from the print resource is transmitted to the user electronically. Finally, include here resources that have been created by the staff. Depending on the level of detail desired, each of the resources listed above can be designated individually and will also be designated as belonging to one of the following categories: Free (electronic), Staff-Created (electronic), Proprietary (vendor-based electronic), Traditional (print-based) and Other.

Rationale: "Sources used" is an important descriptive measure that will have a decided impact on broad-based decisions concerning allocation of resources both for the digital reference service and for the library as a whole. Additionally, determination of sources used can also serve to assist in collection development decisions regarding the percentage of budget allocated to proprietary or fee-based resources and print resources based on the availability of comparable free resources.

Data Collection Procedure: Manual Log Analysis.

Collected by: Staff; tabulated by designated staff or manager or supervisor.

Frequency: Log kept daily, tabulated and collected monthly, reviewed and reported annually.

Procedures: You may choose from one of two possible approaches to this measure depending on the level of detail desired:

1. If a high level of detail is required or desired, the resources used can be described in detail using a manual log sheet and will include those designations as described in the definition above in addition to the additional designation of Free, Staff-Created, Proprietary, Traditional and Other.
2. If a high degree of detail is not required the sources used may be designated as simply Free, Staff-Created, Proprietary, Traditional or Other on a check list.

NOTE: Only count staff-created resources in that category. Do not also count in the free category.

Helpful Tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.
O. Sources Used Per Question.

Issues and Considerations: Depending on your situation and needs, you may choose to keep more detailed and specific data to track the types of resources used, or just complete the tally sheet using the five broad categories on a checklist. Knowing why you want to use the statistic and the time and staff you have available to collect this information will have an impact on your decision. If you want to do a high level analysis of the use of resources by subject area in addition to breakdown by type of resource, the detailed approach is appropriate and useful.

14. Repeat Users (Return Rate)

Definition: This statistic represents the number of users who utilize the digital reference service more than once.

Rationale: The number of repeat users (or return rate) is a measure that can indicate satisfaction with the service. The return rate can also be used in conjunction with other measures to determine a relative ratio of new users to return users.

Data Collection Procedure:
Other: Manual Log Analysis.

Web Log Analysis.
Digital Reference Tracking Software Report.

Collected by: Designated staff member or manager or supervisor.

Frequency: Monthly.

Procedures: Make arrangements to receive logs and reports from the digital reference staff and technology department if necessary. Receive training in reading and analysis of the electronic logs and reports. Analyze reports to determine the number of users of the service who are repeat users.

This measure should be used in conjunction with the following measures to obtain a more comprehensive and meaningful assessment of how "repeat use" informs the assessment process.
24 – Reason for Use.

Helpful Tools – See Appendix I for:
H. Sample Digital Reference Transaction Record.
M. Sample Digital Reference Data Collection Worksheet – Compilation.

Issues and Considerations: Determining the repeat user is one of the most important measures to collect because it can be an indication of user satisfaction with the service. It can, however, be tricky to collect and even trickier to analyze. Analysis of repeat users should be done in a sensitive and careful manner. It should not be assumed that if users do not use the service more than once that they were dissatisfied with their first use. Conversely it should not be assumed that repeat users are satisfied with the service (in fact, the digital reference service may be the only service available to the user). Some issues that might arise when collecting the data for this measure include the following:

- The time frame that may elapse between first and subsequent uses of the digital reference service. For example, it may take weeks, months or years for a person to use the service more than once.
- Tracking and keeping record of repeat users may be difficult. If the digital reference service is small enough, users' names may be kept in a manual log.
- Commercial reference question tracking and management software (e.g., 24/7, QuestionPoint, LSSI's Virtual Reference) or a reference question database developed by the digital reference service will provide a better electronic measure of this statistic than using weblogs generated from web usage tracking software (e.g., Webtrends). In many cases (as in the case of several people accessing the service from the same machine which happens in a physical library setting, or users submitting questions anonymously), an electronically generated log alone will not give an accurate measure of repeat users. In many cases anonymous access to the digital reference service is permitted, which would prevent collection of completely accurate information. This measure may need to be combined with a more detailed manually kept log of users.
- Finally, this measure will not give an accurate qualitative analysis of why users use the service more than once. This measure can be coordinated with the information gathered in *Measure 24 – Reason for Use*, which reflects the actual reasons for return use for a more comprehensive and meaningful assessment.

LOG AND REPORT ANALYSIS

IMPORTANT NOTE: For the purposes of this section, which includes Measures 15 through 19, log analysis refers to an analysis of data electronically generated by a software program designed to track traffic on a website or email server. Examples of such software include Webtrends http://www.webtrends.com and Webtracker http://www.fxweb.com/tracker. Report analysis refers to electronically generated reports, data and/or information that can be provided by commercial digital reference software such as LSSI's VRS http://www.lssi.com, 24/7 http://www.247ref.org, QuestionPoint or customized reference databases (created in database software such as MS Access). Please note that each of these commercially available resources has specific and predefined definitions for the terminology used. Of particular interest for the purposes of this manual are definitions related to such terms as "sessions," "browser," and "platform". The word "sessions" for the purposes of this manual refers only to the number of sessions registered in an electronically generated report. A "browser" refers to the software program that is used to navigate the Internet (Netscape Navigator, Internet Explorer, etc.). "Platform" refers to an operating system, or underlying the software program that permits a computer system to function (such as Windows NT, Windows 2000, Mac OS, Linux). Also note that electronic reports (as in the case of Link Analysis) can be generated by utilizing well known Internet search tools such as Google. For the purposes of this section log analysis does not refer to manually kept logs or tally sheets.

15. Number of digital reference sessions

Definition: The total number of sessions logged using a digital reference service web page, real time chat software, or interactive digital video as determined by electronic log analysis. Do include sessions at the digital reference service FAQ and archives if these pages exist. Do not include sessions to the library's home page or other pages within the library website that do not relate directly to the digital reference service or provide a direct link to the digital reference service. Also, do not include sessions as determined by a manual log.

Rationale: An analysis of digital reference sessions as documented by the log provides an approximation of the number of visits to the virtual library and can be seen as analogous to the traditional measure "number of people who use the traditional library reference/information desk." This measure can be useful in determining staffing requirements. As one field tester stated, "this is a crucial statistic for gauging level of use trends that are often used for budget/staffing decisions. As long as one realizes that the measure is not a perfect one and how it is imperfect, the [electronically generated] system supplied number can be an efficient relative measure of use." Thus increases and decreases in the number of sessions over time can be used to assess changes in the digital reference service that may occur for a number of reasons. By adding this count to users of the traditional reference/information desk, a more accurate analysis of total reference use may be estimated.

Data Collection Procedure: Log Analysis.

Collected by: Electronically generated report and/or log provided by vendor, but viewed and analyzed by staff and/or manager or supervisor. May need to

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request information from the technology department.

Frequency: Monthly. Reported annually.

Procedures: Make arrangements with vendor and technology department if necessary to receive reports and logs on a regular basis. Receive appropriate training in analyzing the logs. Determine the number of digital reference sessions from the logs or report.

Each vendor and type of software used to generate reports of activity may mean something different when defining sessions. Also, different software products may use a number of data points that reflect activity. For example some chat software products will give a report for "sessions requested" and "sessions honored."

Helpful Tools – See Appendix I for:

J. Digital Reference Question Transaction Log – Real Time Sessions.

Issues and Considerations: "Sessions" as a measurement tool reported by electronically created logs refers primarily to real-time interactive services such as chat, voice over IP, and interactive video. The number of digital reference sessions as an analogous measure to physical library reference desk visits is not a strict analogy. Many people may log in during the same session. The number of sessions may not be proportionate to the number of reference questions received as multiple questions may be submitted during one session, multiple users may be logged in during the same session (as is the case when the question is submitted from a computer within the library or organization). Additionally, and as importantly, different software products define, measure, and report sessions differently. It was recommended by several of the field testers and members of the advisory committee that libraries and digital reference services engage in dialogue with the vendors of such software products to develop a standard for defining the number of sessions.

16. Usage of digital reference service by day of the week

Definition: Usage of service by the day of the week tracks the use of the digital reference service on each of the days of the week over a period of time.

Rationale: This measure will be useful in determining usage, (high volume, average, low volume) by day of the week and as a result will be useful in the scheduling of staff for the digital reference service.

Data Collection Procedure: Log Analysis.

Collected by: Provided by vendor of log or digital reference software. Collected by designated staff member or manager or supervisor.

Frequency: Monthly.

Procedures: Make arrangements to receive logs and reports from the technology department if necessary. Receive training in reading and analysis of logs and reports. Analyze logs to determine usage by tabulating the number of reference questions received by day of the week.

If using weblog software, it may be most useful to look at statistics generated regarding the page on which the reference question submission form or email link appears.

This measure can be used in conjunction with:

17 – Usage of digital reference service by time of day.

Helpful Tools – See Appendix I for:

C. Sample Webtrends Report – Activity by Day of the Week

H. Sample Digital Reference Transaction Record.

Q. Log Analysis – Usage by Day of the Week / Usage by Time of the Day.

Issues and Considerations: The analysis of the weblogs and reports generated electronically will not be able to determine if more than one question was submitted in a single transmission. Another consideration is that the analysis may show that a high number of sessions occur when the physical library is closed, and decisions will need to be made regarding the provision of service on such days. Such analysis may also show that turnaround times (predetermined target times for the provision of an answer after the question has been submitted) may need to be evaluated in light of the data received from the logs. This measure should not be the only criteria used for staffing considerations. The next measure (*Measure 17 – Usage of digital reference service by time of day*) should also be taken into account, as should an analysis of other duties performed by the digital reference staff both within the digital reference service (i.e., creation of pathfinders and FAQ's) and in other areas of the library (since in many cases digital reference staff also perform other library duties). It should also be noted that, because of the limitations of weblog software and to a lesser extent reports generated by digital reference software, this measure and the following measure will not give the entire picture of use of digital reference service, and should be used in combination with other data collection methods (i.e., manual logs and records).

17. Usage of digital reference service by time of day

Definition: Usage of service by time of day tracks the number of reference questions received in hour increments over the course of the day, and is tracked over a period of time. This statistic will be useful in determining peak usage times and slower times.

Rationale: This measure will be useful in determining usage (high volume, average, low volume) by the time of day, and as a result will be useful in the scheduling of staff for the digital reference service.

Data Collection Procedure: Log Analysis.

Collected by: Provided by vendor of log or digital reference software. Collected by designated staff member or manager or supervisor.

Frequency: Monthly.

Procedures: Make arrangements to receive logs and reports from the technology department if necessary. Receive training in reading and analysis of logs and reports. Analyze logs to determine usage by tabulating the number of reference questions received by hour of the day.

If using weblog software, it may be most useful to look at statistics generated regarding the page on which the reference question submission form or email link appears.

Other useful measures related to this measure:

16 – Usage of digital reference service by day of the week

Helpful Tools – See Appendix I for:

D. Sample Webtrends Report – Activity by Hour of Day.

H. Sample Digital Reference Transaction Record.
Q. Log Analysis – Usage by Day of the Week / Usage by Time of the Day.

Issues and Considerations: This measure should not be the only criteria used for staffing considerations. The preceding measure (*Measure 16 – Usage of digital reference service by day of the week*) should also be taken into account, as should an analysis of other duties performed by the digital reference staff both within the digital reference service (i.e., creation of pathfinders and FAQ's) and in other areas of the library (since in many cases digital reference staff also perform other library duties). Another consideration is that the analysis may show that a high number of sessions occur during time periods when the physical library is closed and decisions will need to be made regarding the provision of service during such times. It should also be noted that, because of the limitations of weblog software and to a lesser extent reports generated by digital reference software, this measure and the preceding measure will not give the entire picture of use of digital reference service, and should be used in combination with other data collection methods (i.e., manual logs and records).

18. User's browser

Definition: The user's browser is defined as the type of web browser (internet navigation software program) employed by the user to access the digital reference service (e.g., MS Internet Explorer, Netscape, AOL Browser).

Rationale: Knowing the user's browser can help in the analysis of technical difficulties that may arise when the user submits the reference query. This knowledge may also be useful to the staff when they push websites to the patron, explain login procedures for databases to the user or encounter other situations in which they need to "walk" the patron through a navigational process. Additionally, an overall analysis of the users' browsers can be used in the development and design of the digital reference website. Ideally the digital reference website interface should be compatible with a number of operating systems and platforms.

Data Collection Procedure: Log Analysis.

Collected by: Provided by vendor of log or digital reference software. Collected by designated staff member or manager or supervisor.

Frequency: Monthly.

Procedures: Make arrangements to receive logs and reports from the technology department if necessary. Receive training in reading and analysis of logs and reports. Analyze logs to determine usage by type of browser.

Other useful measures related to this measure:
19 – User's platform.

Helpful Tools – See Appendix I for:
H. Sample Digital Reference Transaction Record.
R. Log Analysis – User's Browser / User's Platform.

Issues and Considerations: The level of detail provided by the log analysis may include detailed information on not only the type of browser that the user is employing to access the service, but also the version. There can be great variations in capabilities and features among different versions of the same browser, and analysis of this data, which can be translated into information that can be used to assist in technical problems and questions, will require staff to have a sophisticated level of knowledge about the variations in browsers. This level of expertise may require additional training of existing staff, the hiring of additional staff, or a collaborative or cooperative agreement between the digital reference service and technology team of the library or organization.

19. User's platform

Definition: User's platform is defined as the type of operating system employed by the user to access the digital reference service (e.g., Windows 98, Windows 2000, Windows NT, Windows Millennium, Windows XP, Linux, Macintosh OS). A further level of detail is also possible that will reflect which release and version of the platform is being used.

Rationale: Knowing the user's platform or operating system can help in the analysis of technical difficulties that may arise when the user submits the reference query. This knowledge may also be useful to the staff when they push websites to the patron, explain login procedures for databases to the user or encounter other situations in which they need to "walk" the patron through a navigational process. Additionally an overall analysis of the users' browsers can be used in the development and design of the digital reference website. Ideally the digital reference website interface should be compatible with a number of operating systems and platforms.

Data Collection Procedure: Log Analysis.

Collected by: Provided by vendor of log or digital reference software. Collected by designated staff member or manager or supervisor.

Frequency: Monthly.

Procedures: Make arrangements to receive logs and reports from the technology department if necessary. Receive training in reading and analysis of logs and reports. Analyze logs to determine usage by user's platform.

Other useful measures related to this measure:
18 – User's browser.

Helpful Tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.
R. Log Analysis – User's Browser / User's Platform.

Issues and Considerations: The level of detail provided by the log analysis may include detailed information on the version of the platform that the user is employing to access the service. There can be great variations in capabilities and features among different versions of the same type of platform (i.e., significant differences between the various Windows platforms), and analysis of this data, which can be translated into information that can be used to assist in technical problems and questions, will require staff to have a sophisticated level of knowledge about the variations in platforms. This level of expertise may require additional training of existing staff, the hiring of additional staff or collaborative or cooperative agreement between the digital reference service and technology team of the library or organization.

USER SATISFACTION MEASURES

20. Awareness of service

Definition: Awareness of service is a measure of how aware the target population is of the availability of the service.

Rationale: Determining the target population's awareness of the service is useful in developing marketing strategies for the service. It can also be used in conjunction with other user satisfaction measures to determine if light or heavy use of the service is a result of awareness of the service to begin with or a result of satisfaction with the service once it has been used.

Data Collection Procedure:
Survey.
Questionnaire.
Interview.
Focus Groups.

Collected by: Staff and management or supervisor.

Frequency: Annually.

Procedures: Determine target population parameters. Determine how best to survey or interview representative sample of target population. Develop survey/interview instrument, which may include questions related to other measures. Decide method for administering survey or interview (phone, paper, electronically, in person). Administer survey. Analyze results. Review survey/interview instrument for possible improvements.

Helpful Tools – See Appendix I for:
T. User Satisfaction Measures – Sample Survey/Questionnaire Questions

Issues and Considerations: Determining the general awareness of the digital reference service by the target population requires that surveys or interviews be conducted across the target population base. The survey must include those who have used the service and those who have not. Selecting a sample group of participants that will provide statistically significant and meaningful results may require a higher level of understanding of statistics and research methods than may be possessed by the library or organization. The library may consider hiring an outside consultant to assist with this measure. The gathering of information for this measure will require the development of a survey, questionnaire, or interview instrument that will get at the information that is needed or desired.

This measure will also require that contacts be made outside the library or organization and may require collaborative agreement with other individuals, departments, or agencies who can assist in the distribution and collection of the surveys. For example, in a public library setting, combining this survey with those that may done by other city or county agencies to assess citizen awareness and satisfaction levels may be appropriate (and cost effective). In an academic setting collaboration could be with other academic services such as admissions and records, student services, and counseling. We are aware that the level of effort required for gathering these measures may be high, however, we feel that this is an important measure for determining the quality of service and suggest that any attempts at getting a sense of the general awareness of the service will provide useful information and will be much better than having no information at all.

Focus groups may be useful for this measure if the geographic area in which the target population resides is relatively small (for example, an academic library or public library setting), but may be less useful for digital reference services that serve a less-well defined area or the population at large (e.g., AskERIC, QuestionPoint, or the Internet Public Library Digital Reference Service).

21. Accessibility of service

Definition: Accessibility of service is a measure of how easily potential users are able to avail themselves of the service and includes (but is certainly not limited to) such factors as: availability (both time and day of the week); site design (simplicity of interface); ADA compliance; ease of use; placement in website hierarchy if using web submission form or email link from the website; use of metatags for digital reference websites (indexed in major search tools, etc.); or multilingual capabilities in both interface and staff, if warranted based on target population.

Rationale: An understanding of the accessibility of the service can assist in management decisions regarding scheduling of staff, design of the digital reference service website, design of the library website, the need for adaptive technology for users with special needs, and the need for multilingual staff, if warranted.

Data Collection Procedure:
Survey.
Questionnaire.
Interview.
Other: testing of accessibility by staff and/or selected group of users and potential users.
Review of accessibility issues by expert consultants.

> ***Collected by:*** Staff and Management or Supervisor.
>
> ***Frequency:*** Annually.
>
> ***Procedures:*** Determine target population parameters. Determine how best to survey or interview representative sample of target population. Develop survey/ interview instrument, which may include questions related to other measures. Decide method for administering survey or interview (phone, paper, electronically, in person). Administer survey. Analyze results.

Each of the potential factors, as identified in the definition above, should be viewed as separate points of assessment, using a variety of the recommended procedures. It is not recommended that these factors be assessed together using a single instrument or procedure.

This measure will require contacting both users and potential users of the service. The complexities of sampling for this measure can be simplified by identifying specific target populations within the general target population. For example, potential and actual users who may have special needs due to visual or hearing differences could be approached for participation in the assessment process by contacting local support groups. Distance learning students could be contacted through their advisors. Cultural groups in the community or on campus can be contacted regarding language considerations.

As of this writing, if the point of service for accessing the digital reference service is a website (either designed and created by a vendor or custom designed by the library or digital reference service), a measure of the degree of accessibility with regard to Americans with Disabilities Act requirements can be obtained by utilizing "Bobby." This website provides a utility in which any web address (URL) can be entered, and a report will be generated that explains any problems the website entered has regarding accessibility for people with visual and auditory difficulties. The current web address for the Bobby site is http://www.cast.org/Bobby.

Finally, it may, in fact, be more cost effective to hire expert consultants on such topics as website placement and ADA regulations to review the digital reference service accessibility components and make recommendations for improvements.

Issues and Considerations: Survey, interview, and testing instruments that will address different accessibility issues must be developed. The administration of these assessment tools can be time consuming and may require a level of expertise and knowledge of statistical and research methods that the organization may not have, so hiring a consultant may be the most effective, efficient and cost-effective method of deriving the information for this measure. In the case of digital reference services affiliated with academic libraries it may be possible to consult with the many research offices or institutes that exist to assist with the assessment. Public libraries may be able to collaborate with a local university's research offices or institutes for assistance. The authors realize however, that this may be beyond the capabilities or budgets of some digital reference services and encourage the service to make an attempt at gathering data for this measure. It is also important if accessibility for special populations (i.e., Hispanics or speakers of other languages or those with special visual, auditory or mobility needs) is an issue that members of these populations be consulted or included in the survey, interview, or testing processes.

22. Expectations for service

Definition: Expectations for service measures levels of service users think they will be getting when they submit a question. A variety of expectations can be measured including the following (see the Glossary for definitions):

- Types of questions that will be answered.
- Format of answers.
- Length of time for the question to be answered.
  (see also *Measure 8 – Digital Reference Completion Rate*)
- Degree of commitment to finding an answer.
- Correct, definitive or comprehensive answer.

Rationale: In many cases, perception is everything. What the users expect with regard to the service can have a decided impact on their assessment of the quality of service. Understanding a user's expectations in each of these areas will assist in the ongoing development of the digital reference. These measures can also be used to analyze the marketing of the digital reference service to determine if the services advertised clearly inform the user of the scope of the service. See the Issues and Considerations section for a more detailed description of each of these expectations.

Data Collection Procedure:

Survey.

Questionnaire.

Interview.

Focus Groups.

Collected by: Staff and Management or Supervisor.

Frequency: Varies, can be conducted annually or on ongoing basis.

Procedures: Determine how best to survey or interview representative sample of users.

Develop survey, interview or questionnaire instrument, which may include questions related to other measures.

Decide method for administering survey, questionnaire or interview. For example, it

may be sent by mail or email, accessed electronically (via website or template survey sent out with each final response), or conducted by phone or in person.
Determine return date for survey if necessary.
Administer survey.
Tabulate and analyze results.

Conducting surveys and interviews of users after they have used the service can be problematic in that it may be difficult to track them down or to get them to agree to participate. Additionally, if the assessment is done after the service is provided, initial expectations held by the user prior to using the service may be colored by their actual experience with the service. It would be ideal to incorporate a short questionnaire or survey periodically either at the beginning of the reference transaction (as part of the reference interview that can be conducted via email, digital reference submission form or at the beginning of a real-time session), or close to an end of the reference transaction. It is also useful to make the completion of the survey or the interview process as simple as possible for the user.

Focus groups are an ideal way to collect the information needed for this measure if the potential participants are able to meet in a face-to-face setting. This may be possible if the potential users are geographically close to one another. However, many digital reference services exist in order to provide service to those who are not in close proximity to the physical library or exist to serve a global population. It may be possible to conduct virtual focus groups as a way of collecting information for this measure from remote users.

This measure can be used in conjunction with:
7- Correct Answer Fill Rate.
Helpful Tools – See Appendix I for:
S. User Satisfaction Measures – Expectations for Service Sample Questionnaire

Issues and Considerations: Even though a digital reference service may be limited in scope to the types of questions answered (for example the service may only answer ready reference questions or may decide not to conduct full fledged literature searches for the user), or by other constraints (such as posted turnaround time, the amount of time to be spent on each question or the formats in which answers will be provided), there will inevitably be potential users of the service who do not read the policies, advertisements, or entry level instructions and will submit an out of scope question. There will also be users who may, in fact, read the policies and limitations but may not know what they mean.

Types of Questions to be Answered

In the reference world, we often use terminology that may not be familiar to the average user. For example, will the average user know what "ready reference" or "instructional" or "literature search" means? Also, when a user is referred to another internal department within the library or to an external organization or agency because the user has asked a question that is not within the scope of service, it may be helpful if the librarian or staff member is willing to elicit from the user what their expectations were and why. This can help in the development of accurate instructions and advertising of the service.

Format of Answers

Knowledge of the expectations of the user with regard to format can help the ongoing development of the service by facilitating the ability to provide materials in a variety of formats. The users' expectations can also help the service to address what may be unrealistic expectations of the users in the development of their digital reference service policies. For example, many new users may believe that everything is available in full-text format or that everything is available on the Internet (including books that may only be found in book format on the shelves of the library), or that, because they are requesting information from the library it will always be available in any format for free.

Length of Time for Questions to be Answered

It is critical to know what users expect in terms of a turnaround time in order to determine appropriate staffing schedules and also to set realistic policies (both in terms of expectation of the user and abilities of the staff to meet those expectations). Many times there is a discrepancy between the user's expectations about how long it will take to answer a question and how long it actually takes to answer that question. In an information society with a media that increasingly promises instant access to information, users may expect to get answers to their questions by simply pressing a button. They may not be aware of the amount of time it may take to conduct searches in multiple databases, or they may not realize that the information they are seeking is not available in the configuration or format that they desire. Also, they may not care that the digital reference staff has received ten questions ahead of theirs that still need to be answered. In an academic or school setting especially, but also in the public library, the user may be facing deadlines (papers or bibliographies due, job interviews the next day) that will impact their perception of the timeliness of the response. It is impossible for any digital reference service to provide instant answers to all users all the time. The nature and complexity of the question, current workload or backlog, technical problems, or lack of expertise may all impact the amount of time it takes to answer a digital reference question. In addition, the method of communication may also slow things down (sending emails back and forth).

Commitment to Finding an Answer

In an ideal world it would be reasonable to expect that the providers of any reference service (digital or traditional) would exhaust all possibilities and "go to the ends of the earth" in an effort to provide an answer for the user. Understanding the user's expectations regarding the degree of commitment to finding an answer will help in the development of policies and guidelines for answering reference questions. Such questions as the examples below can help in setting guidelines for the extent to which the service will go in the provision of an answer:

- "Will we make phone calls or send email to outside organizations or individuals on behalf of the user in an effort to get the answer?"
- "Will we set a certain reasonable length of time to work on each question?"
- "Will we work on the question for *X* length of time before referring to another internal or external service provider?"
- "At what point do we give up if an answer has not been found and how do we notify the patron?"

But in the real world of reference service, many other factors (staffing, budget, resources, workload, etc.) influence how far the service can or will go in providing an answer. Determining the user's expectations regarding the lengths to which the service provider will go in providing an answer can help in defining the parameters of the service. In some cases, the user may, in fact, expect that the level of commitment will be high and these expectations may be unreasonable. On the other hand, the user may not expect the service to provide the level of commitment to locating the answer that it does in fact provide. Getting a sense of the range of these user expectations can be used to develop policies for commitment to finding the answer.

Correct, Definitive or Comprehensive Answer

Of course, both staff and the user expect that the answer given will be correct, definitive or substantially comprehensive. In many cases, however, definitive or comprehensive answers may not be easy. This may occur when the question is an open complex question with many parts or when the question requires a proving a negative. In some cases the question may be one that the digital reference staff is not qualified or equipped to answer. Some examples of such difficult questions include:

- "What is the best treatment available for breast cancer? I want you to tell me what to do."
- "What are my rights as a non-custodial father?"
- "I need a bibliography of every critical essay, book or article on Shakespeare's sonnets ever published."

Of course the digital reference staff will provide some information to the patron, but they cannot tell a patron what the best treatment is for a disease, explain to a patron his/her legal rights, or assure that any bibliography they have provided is exhaustive. In some cases the answer given may not be the one that the patron wants to hear (for example, the only answer to the question "How can I get the state of New York to release information about my birth mother if she might not want me to have that information?" is that you cannot get the state of New York to release such information without the birth mother's permission). In addition, some reference questions can only be answered by giving various viewpoints about a particular issue (for example, "Which political entity has a more legitimate argument for their claims and issues, the Israelis or Palestinians?").

The providers of a digital reference service cannot keep such questions from being asked and may in fact provide resources or referrals to help patrons in deciding the answer for themselves. Examples include: suggesting that they discuss breast cancer treatments or legal issues with a doctor or attorney, or providing various viewpoints on opinion type questions. Providing circumstantial evidence can help users draw their own conclusions regarding questions that require proof in the negative. Regardless of the amount of useful information that the staff provides in response to such questions, it may still be perceived by the patron as not correct, definitive, or comprehensive enough.

On the other hand, the digital reference staff member may not have provided a correct or definitive or comprehensive answer to a question for which such answers exist, but the user may believe or perceive that he or she has in fact received a correct, definitive or comprehensive answer. This situation may result from poor staff attitude and behavior, a lack of skill on the part of the staff member, a lack of resources, or a lack of time to give a full response. The staff member may not double-check sources or evaluate the source of the answer properly (especially in the case of answers gleaned from the internet). The user however, may believe that because the service is providing the answer, that this, in some way, ensures correctness, definitiveness, or comprehensiveness.

23. Other sources user has tried

Definition: "Other sources the user has tried" measures what other resources the user tried prior to submitting a question to the digital reference service. These resources can include, but are not limited to: other digital reference services, traditional reference services, self-service via web (using search tools such as subject directories, search engines, metasearch engines, or online AskA services, usenet groups, OPAC or online database searching, personal collections, subject specialists, etc.).

Rationale: Knowing what other sources the user tried before submitting a question to the digital reference service can be critical in learning what information the user already received in order to avoid duplication of effort. These measures can assist the staff in understanding what else the user would like to know, can assist the staff in assessing whether the user's expectations for an answer are realistic, and also can help staff in assessing the possible initial frustration level of the user when he or she decides to utilize the reference service.

Data Collection Procedure:
Interview: Reference Interview (email, chat, interactive voice or video).
Reference Question Submission Form.

Collected by: Staff.

Frequency: Continuous – at time of reference interview or submission of question.

Procedures: Since most effective reference transactions will include a reference interview that will include this question, the virtual reference interview is the most efficient and logical place to gather this data. Digital reference question submission forms should have a component that asks this question.

Tabulate and analyze results.

The procedures for collecting this measure can include either asking a simple open-ended question such as "What other sources have you tried?" or providing a checklist of possible types of resources. Both procedures were recommended by the field testers.

Helpful Tools – See Appendix I for:
H. Sample Digital Reference Transaction Record.
T. User Satisfaction Measures – Sample Survey/Questionnaire Questions.

Issues and Considerations: Knowledge of the sources that the user has already tried can help to avoid duplication of effort and can help the staff to determine exactly what the user is looking for. It is important when questioning the user on this issue to determine if he or she felt the other information they found was useful. On the other hand, it may be helpful to not assume that the patron knew how to effectively search the resources already tried. It might be useful to determine the user's level of sophistication in searching online information on his or her own (though this must be done delicately). If it is apparent that the user does not know how to effectively search a resource, the search might be conducted again by the staff. By understanding what resources the user has already tried, either successfully or unsuccessfully, the digital reference staff can use this as an opportunity for improving instruction on database use. An understanding of the user's experience with other digital reference services may also help in improving the quality of service.

When analyzing the results of the measure it may also prove useful to look for patterns in user behavior (e.g., a large percentage of users have tried Yahoo or Google, or many used the general periodical database, but seem to be unaware of the specialized resources available). An awareness of these patterns may reflect a need to increase user awareness of both the type and quality of resources available both within the library and in general.

The reference interview is the most logical and efficient vehicle for determining what other sources the user has tried. In some cases when gathering the data for this measure, it may be difficult to elicit the desired information from the patron in the reference interview process. The user may perceive the questions as intrusive and/or a waste of time, but if the need for this information can be expressed clearly, this may help the user to feel comfortable in relaying the information.

It may also be useful to include in the reference interview, or on the reference question submission form, a question regarding how long the user has spent on the question, as this may give an indication of the user's level of expertise or level of commitment to finding and answer.

24. Reasons for use

Definition: Reasons for use is a measure that reflects why the user chose to use the digital reference service either for the first time or as a repeat user. This measure can include such reasons as word-of-mouth, reputation of the library or traditional or digital reference service, advertising, reviews of service, distance from physical library facility, satisfaction with previous service, no other alternatives, etc.

Rationale: Understanding the user's reason for use can play a role in the continuing assessment and development of the marketing of the digital reference service and an analysis of the quality of the present service. This understanding can also help in knowing what the competition is or the availability of other resources to the target population. Knowing the reason for first time use can, in conjunction with other measures, assist in the analysis of the target and actual user population both for the library in general and the digital reference service in particular (e.g., physical distance from the library, hours are convenient, lack of time in busy life). This measure can also be an indicator of a successful program if the reason for first time use is positive reviews or endorsements in the media or by word of mouth, which can be used in requests for additional funding within the library or for the library as a whole. If the user is a repeat user, his or her reasons for repeat use can be helpful in determining the overall success, convenience, or importance of the digital reference service to the user. A close examination of the results of this measure is critical.

Data Collection Procedure:
Survey.
Questionnaire.
Interview.

Collected by: Staff and Management or Supervisor.

Frequency: Varies, can be conducted annually or on ongoing basis.

Procedures: Determine how best to survey or interview representative sample of users.
Develop survey, interview or questionnaire instrument, which may include questions related to other measures.
Decide method for administering survey, questionnaire or interview. For example, it may be sent by mail or email, accessed electronically (via website or template survey sent out with each final response), or conducted by phone or in person.
Determine return date for survey if necessary.
Administer survey.

Tabulate and analyze results.

Other measures to use in conjunction with this one:
14 – Repeat Users.

Helpful Tools – See Appendix I for:

H. Sample Digital Reference Transaction Record.
T. User Satisfaction Measures – Sample Survey/Questionnaire Questions.

Issues and Considerations: Reasons for use by both first time and repeat users can vary widely so a close, objective, and detailed analysis of the questionnaires, survey or interview responses is important. The process can be time consuming, both in the administration and the subsequent evaluation of results, but the knowledge gained can be a strong indicator of the success of a digital reference service.

It is simplistic to view repeat use solely as an indicator of success of the program or satisfaction of the user (though it can most certainly be those things). A close analysis of the data and narrative derived from this measure can indicate satisfaction or success, but also may indicate that users have no other alternative for a number of reasons, and even though they may be repeatedly using the service they may not be entirely satisfied. This measure is one of the most important to gather, and equally important is a thoughtful and objective assessment of the results.

25. Reasons for non-use

Definition: Reasons for non-use refers to an assessment of why people have never used the service or have used the service previously but are not using it currently. For people who have never used the service, this measure can include such reasons as: person was unaware of service; person is uncomfortable with technology; person does not have the technological resources to use the service; person believes they would prefer face-to-face service. For those who have used the service previously but do not use it currently, this measure can include such reasons as: user has been satisfied with previous use, but has no further need for service; user was dissatisfied with all or some of previous experiences with service; user has been able to meet subsequent information needs independently (self-service); user's subsequent information needs have not met the policy parameters for use of the service.

Rationale: Knowing why potential and previous users do not use the service is important in assessing the visibility of the service to the potential user population, understanding what any competition may be doing to attract users, understanding the sophistication level or ability (either cognitively or technically) of the potential user to access the service, and developing an awareness of any negative publicity regarding the service. Analyzing the reasons that people choose not to continue to use the service can be crucial in analyzing and correcting problems with the service if the reason for non-use after previous service is dissatisfaction with the service for some reason. On the other hand, this measure can also be an indicator of satisfaction with the service (i.e., the user has had his/her information need met) or a reflection of the fact that the user has had no subsequent need of the service. Non-use should not automatically be viewed as a negative.

Data Collection Procedure:

Survey.

Questionnaire.
Interview.

Collected by: Staff and Management or Supervisor.
Frequency: Varies, can be conducted annually or on ongoing basis.

Procedures: Determine how best to survey or interview representative sample of users.
Develop survey, interview or questionnaire instrument, which may include questions related to other measures.
Decide method for administering survey, questionnaire or interview. For example, it may be sent by mail or email, accessed electronically (via website or template survey sent out with each final response), or conducted by phone or in person.
Determine return date for survey if necessary.
Administer survey.
Tabulate and analyze results.

Helpful Tools – See Appendix I for:
T. User Satisfaction Measures – Sample Survey/Questionnaire Questions.

Issues and Considerations: It may be difficult to define the target population when measuring reason for non-use by those who have never used the service before.

It has always been difficult in assessment measures to reach the non-user in order to determine why they do not use a particular service. This is also true in the assessment of digital reference services and may be even more so because in some cases (i.e., national or global) there is no clearly defined service population.

In cases where there is a defined service population, collaboration with other departments or agencies (other administrative or academic departments in the case of universities, or other government or municipal agencies in the case of public libraries) may provide an additional mechanism for reaching the non-user.

It is important that the reasons for non-use be analyzed in a careful, objective, and thoughtful manner. One should not assume that a lack of use is an indicator of dissatisfaction with the service, poor marketing or lack of accessibility (though these can certainly be valid reasons). A close look at the reasons for non-use, while a somewhat complex procedure, will help to assess the user's the relative satisfaction or dissatisfaction with the service.

Some field testers indicated that this measure may not be particularly useful on a regular basis because a service already may have more users than can be handled.

26. Improvements needed and additional services that need to be offered.

Definition: Improvements needed describes those areas in which the service can benefit from positive change as determined by user suggestions and complaints, as well as by digital reference staff assessment of the service. Included in this measure is a determination of possible additions to service.

Rationale: A determination of both user and staff suggestions for improvement of and additions to existing service is essential to an analysis of the quality of the existing digital reference service. Improvements needed may include faster turnaround time or better communication on the part of the staff. Additional services that need to be offered may include additional hours or days, increase in the types of reference questions answered, adaptive technology for users with special needs, etc.

Data Collection Procedure:
Survey.
Questionnaire.
Interviews/focus groups.

Other: Unsolicited comments from users and staff.

Collected by: Staff and Management or Supervisor.

Frequency: Varies, can be conducted annually or on ongoing basis.

Procedures: Determine how best to survey or interview a representative sample of users and staff. If conducting a focus group, determine the participants in the focus group and contact them.

Develop survey, interview or questionnaire instrument, which may include questions related to other measures.

Decide method for administering survey, questionnaire or interview. For example, it may be sent by mail or email, accessed electronically (via website or template survey sent out with each final response), or conducted by phone or in person.

Determine return date for survey if necessary.

Administer survey or interview or conduct focus group meeting.

Tabulate and analyze results.

Both user and staff input should be gathered for this measure. In many cases, the users may offer unsolicited comments regarding what they would like to see improved or added. Keeping track of these unsolicited remarks should be undertaken if not done currently and these remarks should be incorporated with the recommendations gathered from users through the more formal methods.

Focus groups may be more practical for staff than users. In addition, inclusion of this topic for discussion at regularly scheduled staff meetings provides for ready-made collection of the information needed for this measure. If conducting a focus group for staff, the facilitator must be chosen well so that the staff sees that person as objective.

Helpful Tools – See Appendix I for:

T. User Satisfaction Measures – Sample Survey/Questionnaire Questions.

Issues and Considerations: Suggestions for improvement may come from either the staff or the user and may reflect differing expectations or recommendations. A detailed and objective analysis of the recommendations for improvement may help to define and/or expand the service. The suggestions for improvement may be perceived as, or in fact may be, intended as criticism, and looking at the results derived from this measure may create uneasy or uncomfortable situations among staff or between staff and supervisors. In addition, it is important to distinguish between those suggestions for improvement or additions to services that can be feasibly implemented, and those that may not fit within the goals and mission of the service that or may not be possible due to budgetary or staffing concerns. For example, a reasonable improvement needed may be an improvement in average turnaround time from three days to two, while an unfeasible suggestion for improvement may be having someone staff the reference desk twenty four hours a day, seven days a week. Feasible additions to service may include staffing the digital reference desk on Sunday evenings, while adding a complex interactive video or voice component to the reference service may be outside of the budget capabilities of the library.

27. Satisfaction with staff service

Definition: Satisfaction with staff service measures the user's perception about how well the digital reference service staff met his or her information needs. Satisfaction with staff service can include the following components:

- **Perceived personalized service** reflects how individualized the service given by the staff to the user was, and can include such factors as responding to the user by name, addressing specialized requests and needs, and responding with customized answers to meet the user's needs rather than with template type responses.
- **Perceived demeanor and attitude of staff in communication** reflects such qualities as the perceived eagerness of the staff to be helpful, the tone of the language used in communication, sensitivity to privacy issues during the reference interview process and other parts of the transaction, and willingness to "listen." Satisfaction with staff can also include the user's perception of the demeanor and attitude of any support and technical staff the user may have occasion to contact.
- **Perceived timeliness of response** reflects whether the user feels that his or her reference question was answered in an acceptable period of time and can include the responsiveness to "rush" questions, whether the question was answered more quickly than was anticipated by the user, or whether or not the question was answered in the expected time frame. The perceived timeliness of response can also include the perception of the timeliness of initial acknowledgement to the user of receipt of the reference question by the reference staff.

Rationale: Generally, this measure can be useful in scheduling of staff, in assessing the communication skills of the staff, and in assessing the quality of service based on the users' perceptions their interactions with staff.

Specifically, this measure will be useful in developing staff skills needed for providing a measure of personalization in a technical environment in which the user is removed from the staff member assisting them. It will also be helpful in developing a model and procedures for interacting with the user. For example, it may be decided that any email correspondence with the user will include a form of address that includes the user's name (e.g., Dear Ruth). In many cases, user satisfaction with a reference service (traditional or digital) depends heavily on the perceived personalization of service and positive attitude and demeanor regardless of other factors such as correctness of answer or speed of response.

This measure is also especially important in a digital reference setting because the traditional measures of attitude and demeanor, such as body language, facial expression, tone of voice, etc., will not be apparent to the user (unless the transaction is a real time video or voice transmission).

An understanding of the user's perception of the timeliness of response can be used to develop turnaround time policies for the service. Perceived timeliness of response can also assist in the scheduling of staff for the service. This will be especially useful if it can be ascertained when submission of rush questions will be at a peak (the end of the semester or during midterms in an academic setting, in the appropriate season for public libraries located in resort areas affected by seasonal influx of population, etc.).

Data Collection Procedure:

Survey.

Interview.

Collected by: Staff and Management or Supervisor.

Frequency: Varies, can be conducted annually or on ongoing basis.

Procedures: Determine how best to survey or interview representative sample of users.

Develop survey, interview or questionnaire instrument, which may include questions related to other measures.

Decide method for administering survey, questionnaire or interview. For example, it may be sent by mail or email, accessed electronically (via website or template survey sent out with each final response), or conducted by phone or in person.

Determine return date for survey if necessary.

Administer survey.

Tabulate and analyze results.

Helpful Tools – See Appendix I for:

T. User Satisfaction Measures – Sample Survey/Questionnaire Questions.

Issues and Considerations: This measure is heavily dependent upon the subjective assessment of the user on a subjective aspect of the digital reference service, but it should not be underestimated in its contribution to the perceived quality of a digital reference service. Personalized service, positive attitude and demeanor, and timeliness of response in any service industry are often seen as the most important measures of quality.

The personalization of digital reference service may be especially critical, and special attention may need to be paid to this area, because in many cases the very nature of digital communication is perceived to be impersonal. Except in the cases of interactive video or voice-based digital reference service, all communication takes place via the transmission of typed text to and from the user and staff member. Strategies for personalization of service that are available to the traditional reference service provider (i.e. greeting the patron first, making direct eye contact, open body language, remembering a patron's name on repeat uses of the service, providing specialized verbal commentary on the resources provided) are not possible and other means of approximating these methods may need to be devised.

Some of the voice sync services (e.g., Live Person, Human Click) provide a minimal "personalized" greeting. It would be interesting to learn if this automated attempt at personalization is perceived as such by the user.

It can be difficult to convey a positive, proactive demeanor and attitude in the digital reference environment because again the normal indicators of attitude and demeanor in face-to-face interactions are not possible in a digital reference setting (unless interactive video is being utilized). A user may submit a reference question to the service and if receipt of the question is not acknowledged immediately, this may be interpreted (correctly or incorrectly) as a poor attitude or demeanor. Also, as has been documented, communication via email has been shown to affect a person's perceived demeanor. The staff member may be warm and open and positive in person, but the communication via email may easily be perceived as neutral or non-caring based on the language being used. An analysis of the data gathered in this measure may indicate a need for written communication training, especially in the arena of digital communication. Formal methodologies and procedures for conveying a positive attitude may be warranted (such as acknowledgement of receipt of a question as soon as possible after such receipt even if the question cannot be addressed immediately). Use of lively positive language can also be used to convey attitude and demeanor.

Perceived timeliness of response may reveal a disparity between what the service sets as a reasonable expectation for response time and the expectations of the user. Factors that are entirely dependent on the user's situation may affect their expectation of turnaround time for the answer to their question. These can include: rush questions, underestimation of the complexity of their question, incorrect or unreasonable expectations regarding availability or format of resources that may be used to answer the question. Factors over which the digital reference service provider has some control include the allocation of staff to the digital reference service, scheduling of staff during peak usage times when it is known that rush questions may be asked, expertise of staff in answering specific types of questions, and knowledge of staff regarding available resources. Use of the data derived from this measure can help in the determination of a reasonable turnaround time, which should be posted with the digital reference service policies.

Questions related to this measure can be included with other user satisfaction measure questions in an interview or survey. Ideally, this interview or survey should be conducted at the end of the reference transaction process because it is sometimes difficult to track down users once the transaction has been completed.

28. Delivery mode satisfaction

Definition: Delivery mode satisfaction is a measure of how satisfied the user is with the electronic delivery method used to answer the reference query. This measure should reflect user satisfaction with answers sent via email or chat, or pushing of websites or downloads to the user, and should reflect relative satisfaction if possible with the digital delivery mode as compared to traditional delivery mechanisms (ILL, delivery of books, self service copying).

Rationale: An understanding of the user's satisfaction with the method of delivery for the answer provides useful information in the ongoing development of the service and decisions regarding possible additions to delivery methods (e.g., adding chat, voice or video technology). This measure will also provide information regarding the technology available to the user (perhaps they do not have the knowledge, ability, or desire to participate in a chat or video transaction) or are still using email systems that do not allow for the receipt of attachments. This understanding can also be used to develop collaborative arrangements with other departments within the library or other external agencies. For example, if a book in the library collection provides the best answer to a question, a collaboration between the lending department and the digital reference service could allow for the placing of a request for the user without having the user initiate the request with that department. Finally, this measure can be used to address the need for training and equipment updates.

Data Collection Procedure:
Survey.
Interview.

Collected by: Staff and Management or Supervisor.

Frequency: Varies, can be conducted annually or on ongoing basis.

Procedures: Determine how best to survey or interview representative sample of users.

Develop survey or interview questionnaire instrument, which may include questions related to other measures.

Decide method for administering survey, questionnaire or interview. For example, it may be sent by mail or email, accessed electronically (via website or template survey sent out with each final response), or conducted by phone or in person.

Determine return date for survey if necessary.
Administer survey.
Tabulate and analyze results.

Helpful Tools – See Appendix I for:
T. User Satisfaction Measures – Sample Survey/Questionnaire Questions.

Issues and Considerations: While this measure may provide data that can be used in consideration of enhancements to the service (by possibly adding desired delivery methods), it may also be decided that such desired changes or enhancements to the service may not be possible due to budgetary or technological constraints.

Questions related to this measure can be included with other user satisfaction measure questions in an interview or survey. Ideally, this interview or survey should be conducted at the end of the reference transaction process because it is sometimes difficult to track down users once the transaction has been completed.

29. Impact of service on user

Definition: Impact of service on user is a critical outcome measure that describes how the user has been affected by the service. Impact on the user will include such effects as: solving an information problem, answering an information need, saving time, and access to resources the user might not otherwise have. It will also include aspects of the patron's life that have been impacted by the service (e.g., user finds employment as a result of information provided about the prospective company prior to the employment interview; user is able to participate in a clinical trial for a serious illness; user is able to find the address of a company to file a customer complaint; student is able to locate six periodical sources for social studies project; college student is able to graduate because she completed her Master's Thesis; medical or nursing students or physicians are able to treat a patient successfully due to information received).

Rationale: Determination of the impact of the digital reference service on the user is extremely important as a validation that the service is an important part of the library service and is important to the user. This measure is especially useful in garnering political and/or financial support for the service itself or the library as a whole. This measure can also provide a sense of personal satisfaction to individual staff members who are necessarily removed from the user physically in a digital reference environment and otherwise may not learn the results of their efforts. The effect of understanding the impact of the service on the user can improve employee morale and job satisfaction.

Data Collection Procedure:
Survey.
Interview/Focus Groups.
Other: Unsolicited input from user.

Collected by: Staff and Management or Supervisor.

Frequency: Varies, can be conducted annually or on ongoing basis.

Procedures: Determine how best to survey or interview representative sample of users.
Develop survey, interview or questionnaire instrument, which may include questions related to other measures.
Decide method for administering survey, questionnaire or interview. For example, it may be sent by mail or email, accessed electronically (via website or template survey sent out with each final response), or conducted by phone or in person.
Determine return date for survey if necessary.

Administer survey.
Tabulate and analyze results.

One suggestion for getting at some of this information is to draw a random sample of users who received answers. After a period of time (typically two to six months) contact the user to determine impact. This process can be facilitated at the time of the digital reference transaction to see if the user is willing to be contacted at a later date to be interviewed or to fill out a survey regarding the impact of the service.

Unsolicited stories or anecdotes about impact are often provided by users. These should be collected and included with those gathered by more formal methods when doing the assessment.

Helpful Tools – See Appendix I for:

T. User Satisfaction Measures – Sample Survey/Questionnaire Questions.

Issues and Considerations: Impact of the service on the user is arguably the most important measure of digital reference service with regard to quality of service. Anecdotal and qualitative evidence of a digital reference service's impact is extremely compelling for political and funding reasons. Impact on the user's life is often one topic that library or organizational boards and government officials and legislators ask about when considering funding for libraries in general and digital reference service in particular. Unfortunately, this measure is also one of the most notoriously difficult to determine. In many cases the full impact of the service on the user may not be apparent to the user until long after the question has been answered. It may be difficult to track down the user for participation in a survey or interview/focus group. Some examples of impact on the user that may not occur until relatively later include the following scenarios:

- The user is a graduate student who needs to locate an obscure article for use in the development of her thesis. It may take several semesters for the thesis to be completed.
- The user is a multiple myeloma patient who requests information on clinical trials and bone marrow transplants. He subsequently undergoes the transplant and his life has been extended by several years as a result.
- The user requests information on how to write a resume and then is offered a position by several companies to which she applied.

In other cases the impact of the service may be real, but not recognized by the user (as in many other situations, good library service is often taken for granted by the user).

If the digital reference service is able to collect anecdotal, qualitative, or statistical data on impact of the service to the user (either solicited or unsolicited), the data can be used to advertise the service, to justify expenditures on the service and in lobbying efforts for funding.

30. User demographic data

Definition: User demographic data is data that defines characteristics of the user population and includes such attributes as age, race, gender, education, employment and profession. For academic library services, such user categories as faculty, staff, and student (with further classification by undergraduate, graduate, doctoral or professional) should be included. For public library service such user categories as age (with further classification by child, young adult or adult), occupation, and residency status in legal service area might be collected.

Rationale: An analysis of the users' demographic data can determine if specific characteristics of the users fall into detectable patterns that can be used to modify or enhance the service. Additionally, this data can be used for collection development to determine the range of resources that might be warranted to meet the specific needs of a particular demographic group. Some examples include: online children's encyclopedias for users under the age of 10, online peer reviewed e-journals for graduate students and faculty, online databases in Spanish (both in the search interface and the content) for a largely Hispanic population, self-help and support materials for young mothers). Additionally, this demographic data can be used to determine which demographic users groups are not utilizing the service, and efforts can be made to determine why and to address the unmet needs of those groups.

Data Collection Procedure:
Survey.
Other: Analysis of user data provided by various sources such as registration files, digital reference submission forms, etc.

Collected by: Staff and Management or Supervisor.

Frequency: Varies, can be conducted annually or on ongoing basis.

Procedures: Determine how best to survey or interview representative sample of users.

Develop survey, interview or questionnaire instrument, which may include questions related to other measures.

Decide method for administering survey, questionnaire or interview. For example, it may be sent by mail or email, accessed electronically (via website or template survey sent out with each final response), or conducted by phone or in person.

Determine return date for survey if necessary.

Administer survey.

Tabulate and analyze results.

Helpful Tools – See Appendix I for:
H. Sample Digital Reference Transaction Record.
T. User Satisfaction Measures – Sample Survey/Questionnaire Questions.

Issues and Considerations: The collection of user demographic data directly from the user may be perceived as intrusive by the user. If the data is to be collected from other sources, it is important to focus on those demographic categories that will prove the most useful in improving quality of service. In the interest of saving time, it is important not to collect demographic data just for the sake of collecting it. Often such data must be gathered from a variety of sources and this can be time consuming. In the case of gathering demographic data concerning children, only non-identifying data must be collected. Also, if the data is to be collected directly from the child via a survey, parental permission may be needed before the child can complete the survey.

COST

31. Cost of digital reference service

Definition: The cost of digital reference service is the total cost for providing the service and includes the cost of staff (including salaries and benefits), digital resources (licensing fees, support, etc.), infrastructure (including hardware, software, telecommunications, website hosting fees, domain name fees), lease, mortgage or rental costs, marketing and advertising, training, print materials (if used for digital reference), supplies, and any other costs associated with the digital reference service. In cases where digital reference is provided as an integrated component of the regular reference service or where staff and resources are shared between the digital reference service and the regular reference services, costs should be prorated.

Rationale: Knowing the cost of any library service is crucial when developing budgets and in making managerial decisions regarding allocation of resources. The cost of providing digital reference service is important at this overall management level and also for planning and allocation of resources within the service.

Data Collection Procedure: Other:
Collection and analysis of cost component data including invoices, personnel expenditures, advertising expenditures, tuition/education costs, etc.

Collected by: Manager or Supervisor.

Frequency: Varies but typically conducted annually.

Procedures: Gather required information from annual reports, personnel records (for salary information), and/or the business office.

Helpful Tools – See Appendix I for:
U. Cost Worksheet.
V. Cost – Electronic Resources Prorate Worksheet.

Issues and Considerations: It has always been difficult to determine exact costs of any service within a library for many reasons. In many cases staff and resources are utilized by more than one service area within the library, and it is difficult to prorate out costs for any one area. Some resources are utilized both within the library and externally (as in the case of remote access to databases), so it is difficult to ascribe the cost to any one department. These same issues also affect the digital reference service. Some of the most costly resources for the provision of digital reference are subscriptions and licenses to online resources and databases. These resources are also available for use by other departments and by the patron from both within the library and at home. Also, different vendors have been varyingly successful or interested in providing meaningful statistics and data about database use. In many cases it is impossible to determine what percentage of costs can be allocated to the digital reference service (especially when authentication is by IP address only). Staff members perform the duties of traditional and digital reference at the same time, and keeping track of time allocated to either can be problematic. It is important, however, to make an attempt to determine costs.

32. Cost of digital reference service as a percent of total reference budget

Definition: Cost of digital reference as a percentage of total reference budget is a comparison of the total cost of the digital reference service in relation to the total reference budget, which includes traditional, hybrid, and digital reference service. This comparison is expressed as a percentage.

$$\boxed{\frac{\text{Cost of digital reference}}{\text{Total reference budget}} \text{ X } 100}$$

Rationale: It is important to be able to know the relative cost of the digital reference service to the total reference budget so appropriate allocation can be made to the digital reference service (and also to the traditional service, if warranted). Budgetary considerations (regarding the relative cost to relative benefit) are important in any organizational setting, and are critical in the digital reference setting because the cost of providing digital reference can often be comparatively high due to possible staffing issues (both in terms of expertise and time), cost of resources (software, online databases), training needs (staff must be trained not only in traditional reference service but also in technical and computer service), etc.

Data Collection Procedure: Other:
Collection and analysis of cost component data including invoices, personnel expenditures, advertising expenditures, tuition/education costs, etc.

Collected by: Manager or Supervisor.

Frequency: Varies but typically conducted annually.

Procedures: Gather required information from annual reports, personnel records (for salary information), and/or the business office.

Determine the cost of the digital reference service and then divide by the total reference budget. Multiply by 100.

Helpful Tools – See Appendix I for:

W. Cost of Digital Reference as Percent of Total Reference / Total Library Budget.

Issues and Considerations: One of the most critical difficulties in determining this extremely important measure is that it has been difficult for libraries to determine the real costs of the overall reference budget. Confusion and disagreement about line item allocations (especially with regard to the purchase of online databases and prorating of personnel cost for those staff members who perform multiple job duties) may make it difficult to obtain a point of comparison. Additionally, in the overall library budget, automation and reference budget lines may be separate even though the cost of digital reference service may not make such distinctions. Prorating the cost of fee-based online databases (which is often a substantial portion of a library's budget) may also prove problematic in that it is often difficult to determine use strictly by the digital reference service versus use for regular reference service, or use by the patrons in the library itself versus by remote users.

This measure will also be more difficult when digital reference service is being provided as part of a collaborative effort in a consortium.

33. Cost of digital reference as a percent of total library or organizational budget

Definition: Cost of digital reference service as a percentage of total library or organizational budget is a comparison of the cost of the digital reference service to the total library or organizational budget expressed as a percentage.

$$\boxed{\frac{\text{Cost of digital reference}}{\text{Total organizational budget}} \text{ X } 100}$$

Rationale: In any library or organizational setting, it is crucial to understand the relative cost of any service that is part of the organization to the organization as a whole. Informed budgeting decisions and allocation of resources throughout the organization can only be made if the cost of each service is known. Additionally, the cost of the digital reference service in comparison with the total organizational budget can be used to leverage for more resources if the relative cost is much less than the benefit and use generated by the digital reference service.

Data Collection Procedure: Other: Collection and analysis of cost component data including invoices, personnel expenditures, advertising expenditures, tuition/education costs, etc.

Collected by: Manager or Supervisor.

Frequency: Varies but mainly annually.

Procedures: Gather required information from annual reports, personnel records (for salary information) and/or the business office.

Determine the cost of the digital reference service and then divide by the total library or organizational budget. Multiply by 100.

Helpful Tools – See Appendix I for:

W. Cost of Digital Reference as Percent of Total Reference / Total Library Budget

Issues and Considerations: It is often difficult to determine an exact cost for digital reference service in settings where staff members may be shared between a formal digital reference service and traditional reference service, or where the digital reference service is an integrated part of traditinal reference service. It may also be difficult to determine costs when online databases are used by reference staff, other library staff and patrons alike, both in the physical library and from remote settings. Additional problems may include prorating costs for equipment and software that may be used by the digital reference staff and other library staff.

This measure will not be as useful for those digital reference services that do not exist within the context of a larger library service (e.g. AskERIC and other AskA services, which exist solely to provide digital reference).

STAFF TIME EXPENDED

34. Percent of staff time spent overseeing technology

Definition: Percent of staff time overseeing technology is the percentage of time that staff spend installing, repairing, and maintaining hardware and software compared to total staff time devoted to digital reference service (staff time overseeing technology plus other staff time devoted to digital reference service).

$$\frac{\text{Staff time overseeing technology}}{\text{Total staff time for digital reference}} \times 100$$

Rationale: The nature of the provision of reference service is changing both in the traditional setting of the library and in the digital reference service arena. In both cases it has been reported, anecdotally and in studies, that reference staff spend an increasing amount of time overseeing the technology. In digital reference, such time can be expended in activities such as creating, maintaining, and updating the digital reference website, downloading updates for virus protection, and diagnosing and correcting problems with hardware, software, and peripherals (modems, scanners, printers, monitors, configurations, etc.). The skills required to perform these tasks are in addition to those required for providing quality reference service. It is important for management to know what percentage of time their staff is devoting to each of these dual roles. This information can be helpful in making hiring decisions, staffing and compensation decisions, and when analyzing and evaluating employee performance and job satisfaction.

Data Collection Procedure:
Sampling.
Survey.
Interview.
Other: analysis of manual log.

Collected by: Manager or Supervisor or designated staff member.

Frequency: Logs are kept daily. It is recommended that this detailed information be gathered over the course of a typical week and repeated several times throughout the year.

Survey/interview is administered to staff on periodic basis such as once per year.

Procedures: Determine which activities meet the criteria of overseeing/ supporting technology.

Develop a manual log for registering this use of time.

Develop and administer a survey/interview instrument that elicits staff perceptions of the amount of time spent overseeing the technology.

For this measure, count all time creating, maintaining, and updating the digital reference website, downloading updates for virus protection, and diagnosing and correcting problems with hardware, software and peripherals (such as modems, scanners, printers, monitors, configurations). Also include staff time spent on learning how to oversee the technology as delineated above.

In many cases, staff members are responsible for overseeing technology that is used by several departments within a library, including the digital reference service. It may be difficult to break out the portion of their time that should be allocated to the digital reference service. Some options for dealing with difficult problems include:

- Using the same percentage derived from *Measure 33 – Cost of Digital Reference Service as a Percent of Total Library or Organizational Budget*. This is the easiest but also the least precise method. It is artificial and does not get at the very real fact that time spent overseeing technology related to digital reference may not be directly proportional to the percentage of the total budget that the digital reference encompasses.

- Only measure the time spent on overseeing technology that directly relates to the digital reference service.
- Only include time spent on overseeing technology by staff members who are directly involved in the digital reference service.

Helpful Tools – See Appendix I for:

X. Staff Time Expended – Percent of Time Overseeing Technology.

Issues and Considerations: Collecting the detailed information required by this measure can be time consuming and confusing, and will require detailed record keeping by the digital reference staff. In spite of the difficulties in gathering and calculating the data necessary for this measure, it is one of the most important measures from a management perspective. In addition, the tasks and skills required to oversee the technology may not match those required to provide direct digital reference service. However, due to budgetary concerns or to the fact that the service may have evolved in an unplanned way, many digital reference librarians also function as their own technical support.

35. Percent of staff time spent assisting users with technology

Definition: Percent of staff time spent assisting users with technology is the percent of staff time spent in informal, non-scheduled, one-on-one technology training with users compared to total staff time devoted to digital reference. This measure refers only to assistance offered to those users using the digital reference service. It does not refer to assisting those users who are utilizing the traditional reference service.

$$\frac{\text{Staff time assisting users with technology}}{\text{Total staff time for digital reference}} \times 100$$

Rationale: The results of the initial site visits for this study and others have suggested, anecdotally at least, that there appears to be a significant percent of staff time assisting users with the technology in addition to the provision of actual reference service. Such activities include teaching users how to: download software (such as Adobe Acrobat Reader) for viewing pdf files; save images to disk; import results from a periodical database into a spread sheet or bibliography software, etc. These types of duties require special skill on the part of staff. An understanding of the percent of time staff spend on such tasks can assist management in making staff assignments, developing training programs for staff, hiring decisions. They can also be crucial in assessing staff performance and job satisfaction.

Data Collection Procedure:

Sampling.
Survey.
Interview.
Other: analysis of manual log.

Collected by: Manager or Supervisor or designated staff member.

Frequency: Logs are kept daily. It is recommended that this detailed information be gathered over the course of a typical week and repeated several times throughout the year.

Survey/interview is administered to staff on periodic basis such as once per year.

Procedures: Determine which activities meet the criteria of supporting users with technology.

Develop a manual log for registering this use of time.
Develop and administer a survey/ interview instrument that elicits staff perceptions of the amount of time spent assisting users with technology.

Helpful Tools – See Appendix I for:
Y. Staff Time Expended – Percent of Time Assisting Users with Technology.

Issues and Considerations: The nature of reference service and the skills needed to provide reference service are rapidly changing. As a result of the increased role technology plays in information provision, the role of the reference librarian has been steadily shifting to encompass both the provision of information and the provision of instruction to the user. While reference librarians have always had to provide some instruction to the user (how to use complicated indexes, how to use the subject headings indexes, how to read a citation, how to use the card catalog, how to properly cite sources), the type of instruction required now includes providing instruction to the user in the sphere of technological and computer-based knowledge. For example, reference librarians are now expected to instruct users in how to: navigate a website, download documents, use Boolean logic in online databases and Internet search tools, handle printer problems, etc. The collection of data for this measure will require development and maintenance of logs detailing the amount of time the digital reference staff spend assisting users with the technology. This measure, like *Measure 35 – Percent of Staff Time Overseeing the Technology* is important in hiring and assignment of staff for digital reference service and in the development of training for staff. Thus, even though this measure is complicated and time consuming, it is important to get an accurate measurement regarding the percentage of time digital reference staff spend instructing users in the use of technology.

OTHER ASSESSMENT OPTIONS

The following three techniques can also be incorporated in the assessment process and can be used for quality control and training.

Peer Review

Peer review is a process where reference librarians review and critique the email question-answer sets and/or the transcripts from chat reference sessions performed by their peers, and provide each other with feedback and, where applicable, suggestions for improvement. Review needs to be based on established and formally stated criteria for reference performance and may include evaluation of appropriateness of response, use of standard scripts, accuracy of answer, completeness of answer, use of resources, referral and appropriateness of referral. It is not recommended that this process be used as input for individual performance appraisal tied to raises or promotion.

Enhanced Reference Logs

Enhanced reference logs are records of digital reference experiences kept by individual librarians to document professional insights, observations, issues, difficulties, successes, etc., that they experience in providing digital reference. These logs can be especially useful for capturing issues/events that were not anticipated or planned for when the service was designed and for collecting professional input on how the service, professional training, and library policies and procedures relating to digital reference can be improved.

Librarian Discussion Groups

Library discussion groups are meetings that provide a forum in which digital librarians can discuss their work and share their experience, knowledge of resources, and suggestions for improving digital reference services, find help with difficult questions or situations, and generally support each other in their professional growth.

QUALITY STANDARDS

Developing Quality Standards

This section of the manual provides guidance on the development and use of quality standards related to digital reference services. The actual level or standard included in a quality standard is determined by library staff and administration, but the need for and use of standards, example quality standards, and the process for developing a quality standard can be described here.

Definition and Importance

A quality standard is a specific statement of the desired, or expected level of performance that should be provided by a service or some aspect of that service. A quality standard can be measured to determine the degree to which that standard is, in fact, being met. A quality standard defines the level of performance that an organization is willing to accept for a particular service or activity. Quality standards are important because they:

- encourage library staff and administration to discuss and agree upon what constitutes "quality" for a specific service;
- provide clear guidance as to the expected quality that a particular service or activity should offer;
- educate staff – and especially new staff – as to the expected quality of service that should be provided;
- recognize that there maybe differing acceptable levels of quality for different aspects of digital reference services; and
- provide a basis for rewards and demonstrating/reporting accountability.

Quality standards draw upon statistics and measures that are described elsewhere in this manual. Quality standards are not performance measures. A performance measure might be "correct answer fill rate" whereas the quality standard might be "the digital reference service will have a correct answer fill rate of 65%."

Example Quality Standards

We propose the following quality standards to be used with the provision of digital reference services.

1. **Courtesy**. Users of the digital reference service will rate the courtesy of library staff providing digital service as a score of *X* on a scale of 1 (discourteous) to 7 (very courteous). The process for collecting data to produce this standard is a survey that can be attached to the digital reference response. Or, users of the digital reference service may be contacted at a later date via telephone, email, or other means to obtain their assessment.

2. **Accuracy**. Library staff will provide a correct answer fill rate of *XX*%. Correct answer fill rate is the percentage of correct answers given to all questions received. The process for producing data for this standard is that a peer group of digital reference staff will examine a sample of digital reference transactions logs and judge the answers provided to be: correct, incorrect, referred, or cannot determine. The percentage of those responses judged to be "correct" will be compared against all questions asked to determine the accuracy of the digital reference services being provided.

3. **Satisfaction.** Users of the digital reference service will rate their overall satisfaction with the service as a score of *X* on a scale of 1 (very dissatisfied) to 7 (very satisfied). The process for collecting data to produce this standard is a survey that can be attached to the digital reference response. Or, users of the digital reference service may be contacted at a

later date via telephone, email, or other means to obtain their assessment.

4. **Repeat Users**. At least *XX*% of all users of the digital reference service will ask two or more questions per week, month, or other time period. The process for collecting this data is to analyze the log files and determine how many times the same IP address, user ID, or other identifier has asked a question of the digital reference service during a specific time period.

5. **Awareness**. At least *XX*% of a specific target population (specific population group, e.g., graduate students) will be aware that the library provides (specific type of) digital reference services. Awareness is defined as the population user group's knowledge that the service exists. The process for collection of this data is to conduct a survey of the target population to determine the extent to which the population group is aware of the service.

6. **Cost**. The cost per digital reference transactions will not exceed $*XX.XX*. Using the procedures described earlier in this manual, library staff will compute the cost per digital reference transaction. The average cost should be based on a sample conducted over an acceptable period of time. The average cost per transaction is then compared against the agreed upon quality standard.

7. **Completion Time**. The average completion time for digital reference transactions will be *X* amount of time. This quality standard will vary greatly in each situation for a number of reasons including types of reference questions answered, difficulty of reference questions answered, and hours of operation. This quality standard should be determined very carefully keeping in mind that the fastest service may not always be the best, but that users do expect responses in a timely fashion.

8. **Accessibility**. Accessibility refers to a wide range of factors including ease in finding and using the service and availability of adaptive software for users with special needs. Quality standards such as "A user will be able to access the service with only *X* number of clicks from the library home page" or "Every user with special visual needs will be able to 'read' every word and link on the digital reference homepage using voice reading technology."

The above quality standards suggest the way in which the various statistics and measures outlined earlier in the manual can be translated into quality standards. Those proposed here are examples; library staff may wish to develop additional or substitute quality standards.

Determining the "Right" Standard

This is no "correct" standard for any specific digital reference service. The correct standard will depend on the goals and objectives of the library, the amount of resources that can be committed to reaching a particular standard, local situations affecting digital reference services, and the relative importance of one quality standard versus another. For one library, an awareness level of digital reference services of 30% among faculty (for example) may be acceptable; for another, the standard might be 60%.

Typically, when setting quality standards, a group of library staff and administrators will first benchmark the existing performance for a particular proposed criterion (awareness, satisfaction, etc.). For example, they would collect data to determine what the existing correct answer fill rate is. If they determine that the existing rate is a 45% correct answer fill rate, then the next step is to discuss if this is an acceptable level for the standard. Given the goals, resources, and unique situations affecting digital reference at a particular library it may or may not be acceptable.

As an external check on the appropriateness of a standard, library staff can meet with users of the service and obtain their input as to an appropriate level for the standard. Library staff might be quite surprised to learn that users of the digital reference service may have very different levels of expectations for the quality of a service. If significantly different levels of expectations in level of quality between library staff and users exist, additional discussion will be necessary. The important point, however, is that library staff and administration agree on what the correct answer fill rate standard should be and then strive to meet that standard.

Whatever quality standards are developed for a particular digital reference service, it is important to regularly check the library's performance on that standard over time. Is the library meeting the standard? If not, why not? If the standard is being met should the quality standard be increased to promote better service and performance? These and related questions should be ongoing.

GLOSSARY

Async
Async refers to transactions/communications that occur between the staff and user that do not occur in real time. There will be a gap in time between such communications. An example of an async transaction in a traditional library setting would be the submission of a print subject request form. In the digital reference setting an async transaction would include the submission of an email or online webform request to the service.

Digital Reference Answer
For the purposes of this manual a digital answer is the aggregate of responses sent in response to a digital reference question submitted by the user. The aggregate of responses is counted as one digital answer. A digital answer must be sent entirely via computer or digital means. A digital reference answer also includes referrals to other contact points and directions to resources that would enable the user to locate the answer on his/her own.

Digital Reference Question
For the purposes of this manual a digital question is a question that is submitted to a digital reference service using digital means (i.e., must be transmitted via computer using such methods as email, webform, chat, or interactive video). Questions submitted by fax or phone are not considered digital questions. Questions that are received digitally but responded to with non-digital means are not considered a digital reference question for the purposes of this manual.

Digital Response
A digital response is any communication that is sent to the user electronically in response to a digital reference question. A digital response will not necessarily include the answer to the reference query, and may in fact be an acknowledgement of receipt of the question, a request for more information, a request for clarification, or a message asking if what has been found is satisfactory.

Format of Answers
Format of answers includes: all full-text material, combination of full-text and citation or abstracts, journal articles only, web-pages only, complete literature searches, analysis of materials located, placement of request for books, or delivery of actual books. This measure can also reflect the expectations of the user in terms of physical format, i.e., html, pdf, ASCII or plain text, or various word processing formats (such as MS Word, Word Perfect). Additionally, the expectation of the user may include that the digital reference service staff will provide conversion of material from one format to another.

Logs and Reports – Electronic
An electronically generated log or report is one that is provided with weblog software (such as Webtracker or Webtrends) or digital reference software (such as 24/7 or LSSI's VRS), or custom designed databases (using such products as MSAccess).

Logs and Reports – Manual
A manual log or report is one that is created by the user. Entries are made manually into a log and reports based on the logs must be generated manually.

Real-time
Real time refers to a description of a transaction or communication that occurs between staff and the user without any intervening time between the points of communication.

Interactive Video

Interactive video digital reference is the ability of the staff and user to view each other using video signals transmitted through the computer. This type of digital reference transaction seeks to simulate a face-to-face transaction that would occur in a physical library setting. Advantages are that the staff and user can read each other's body language and gather much information regarding attitude and demeanor from the "face-to-face" setting. Some limitations to the implementation of interactive video are that it requires a great deal of bandwidth, special equipment and software for both user and staff.

Sync

Sync refers to transactions/communications that occur between the staff and user in real time. There is no delay or gap in time between the receipt of communication and response. Examples of a sync transaction in the traditional reference area are the face-to face reference interview and a telephone conversation. In a digital setting sync transactions include chat and interactive video.

Voice over IP (VoIP)

Voice over IP (VoIP) allows for the staff and user to talk to and hear one another over an Internet connection. The primary advantage of voice over IP is the ability of the user and staff member to engage in a real time conversation. This saves time in the reference interview process, avoids possible long distance phone charges, and allows for both the user and staff member to detect inflections in tone of voice that may impact the reference transaction. The primary disadvantages are that VoIP is bandwidth intensive and that transmissions often experience static, or are unclear.

Types of Reference Questions

Bibliographic

A bibliographic reference question is one that relates to any aspect of authorship or publication of a work. Bibliographic reference queries include verification of a citation, names of authors, information about works in a series, edition information, copyright information, etc.

Instructional

An instructional question is one in which the user asks for assistance in using electronic resources that may be available to them, and that may provide the answer to another reference question. Examples of instructional questions include requests for information on how to construct a search statement in an online periodical database, how to search the online catalog (OPAC), how to request books and other materials from the catalog, how to limit searches by domain in a particular search engine, and how to use Boolean Logic.

Literature search

A literature search is a request for all of the published literature on a given topic or by a given author. The literature search may be limited by such factors as date, place of publication, peer-reviewed journals only, etc.

Other

For the purposes of this manual, "other" refers to those questions that are within the scope of the service but do not fit into any of the other categories. Digital reference questions that fit more than one category should be classified as "other."

Out of Scope

An out of scope question is one that will not be answered by the digital reference service because it does not meet the criteria set by the service for provision of an answer. Out of scope questions are often referred to another service within the organization or to an outside agency or service.

Reader's Advisory
A reader's advisory question refers to requests for information regarding material they would like to read. Reader's advisory questions often take the form of asking for similar books by plot, other books by an author, other books in a series, availability of works in a specific format (e.g., large type, book on CD or tape) works in a particular language, or information about the background of a particular book.

Ready Reference
Ready reference (or quick fact) questions are those that usually have a single, finite answer. The answers can generally be found in common reference works such as almanacs, encyclopedias, directories, dictionaries, atlases, thesauri, and factbooks. Some examples of ready reference questions include: What is the population of Indonesia? What is the capital of Brazil? On what date did Queen Victoria die? How do you spell "symbiotic"? It should be noted that many digital reference services will only answer ready reference type questions.

Research or Subject Request
A research question is one that requests a variety of information on a particular topic. The research question will most likely have many components to the answer (i.e., articles from journals, book citations, essays, statistics, raw data) and the answer may consist of responses sent in many formats (emailing of full-text articles or citations, pushing websites, documents or spreadsheets, image files, video clips, etc.).

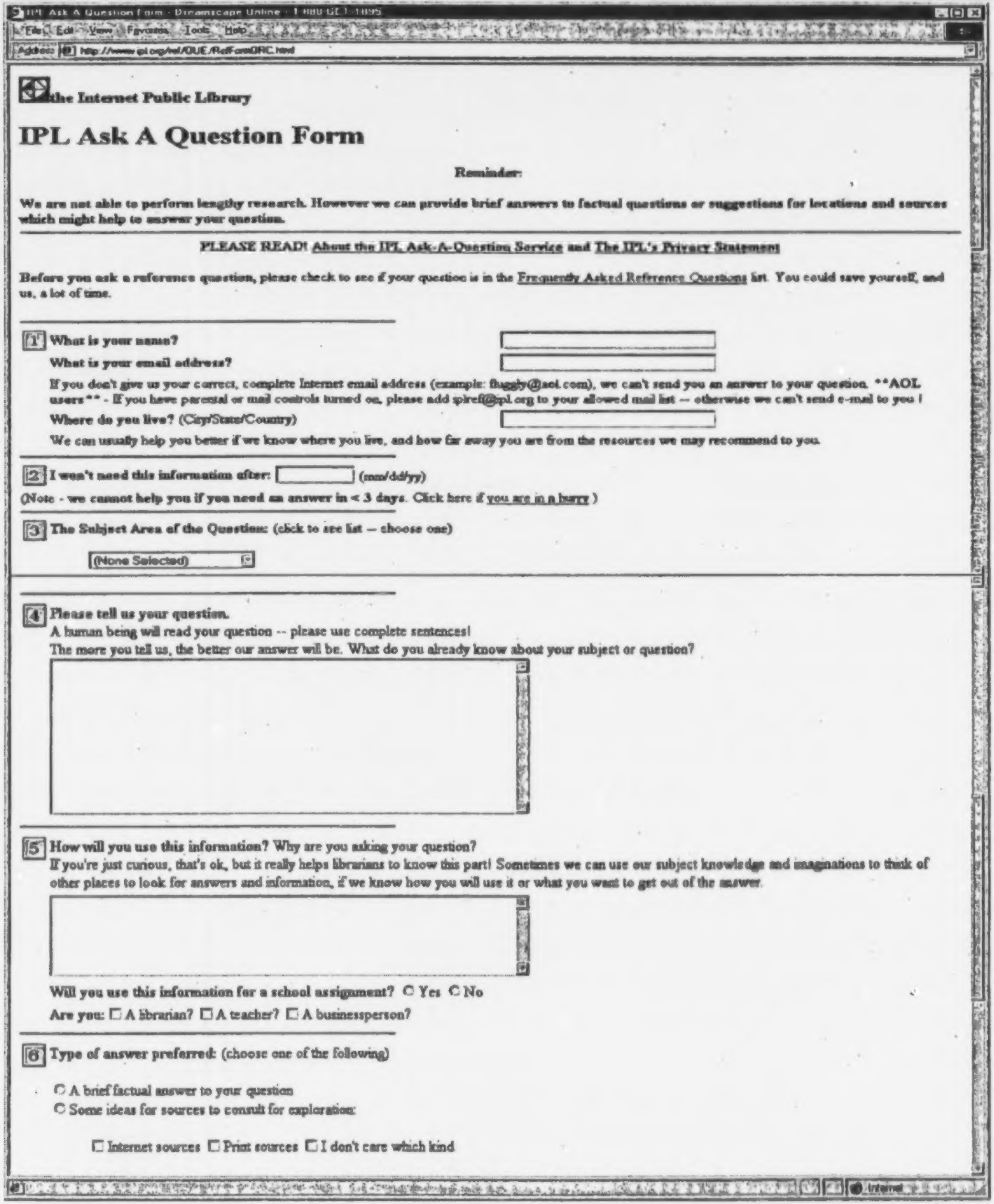
Technical
A technical question is defined a as reference question in which the user asks for assistance in the use of the technology required to access the digital reference service or other aspects of accessing the library's or organization's website. These questions can include: How do I download Adobe Acrobat Reader? How do I open attachments? How do I install chat software?

APPENDIX I

SAMPLE FORMS, REPORTS, LOGS, WORKSHEETS AND SURVEY INSTRUMENTS

A. Internet Public Library "Ask A Question" digital reference web submission form
B. Sample Webtrends Report – General Statistics
C. Sample Webtrends Report – Activity by Day of the Week
D. Sample Webtrends Report – Activity by Hour of Day
E. Sample Summary Report from 24/7 Reference Software
F. Sample User Satisfaction Transcripts and Reports from LSSI's Virtual Reference
G. Sample Chat Transcription form LSSI Virtual Reference
H. Sample Digital Reference Transaction Record
I. Digital Reference Question Transaction Log – Email
J. Digital Reference Question Transaction Log – Real Time Sessions
K. Total Reference Activity Log – Daily / Two Week Period
L. Digital Reference Completion Time Calculation Worksheet
M. Sample Digital Reference Data Collection Worksheet – Compilation
N. Type of Digital Reference Question Received
O. Sources Used Per Question
P. Log Analysis – Number of Digital Reference Sessions – Real Time
Q. Log Analysis – Usage by Day of the Week / Usage by Time of the Day
R. Log Analysis – User's Browser / User's Platform
S. User Satisfaction Measures – Expectations for Service Sample Questionnaire
T. User Satisfaction Measures – Sample Survey/Questionnaire Questions
U. Cost Worksheet
V. Cost – Electronic Resources Prorate Worksheet
W. Cost of Digital Reference as Percent of Total Reference / Total Library Budget
X. Staff Time Expended – Percent of Time Overseeing Technology
Y. Staff Time Expended – Percent of Time Assisting Users with Technology

SAMPLE
A. Internet Public Library "Ask A Question" digital reference web submission form
http://www.ipl.org/ref/QUE/RefFormQRC.html


IPL Ask A Question Form - Dreamscape Online - 1 888 GET 1895
File
Edit
View
Favorites
Tools
Help
Address
http://www.ipl.org/ref/QUE/RefFormQRC.html
Internet

the Internet Public Library

IPL Ask A Question Form

Reminder:

We are not able to perform lengthy research. However we can provide brief answers to factual questions or suggestions for locations and sources which might help to answer your question.

PLEASE READ! About the IPL Ask-A-Question Service and The IPL's Privacy Statement

Before you ask a reference question, please check to see if your question is in the Frequently Asked Reference Questions list. You could save yourself, and us, a lot of time.

1 **What is your name?**

What is your email address?

If you don't give us your correct, complete Internet email address (example: fluggly@aol.com), we can't send you an answer to your question. **AOL users** - If you have parental or mail controls turned on, please add spiref@ipl.org to your allowed mail list -- otherwise we can't send e-mail to you !

Where do you live? (City/State/Country)

We can usually help you better if we know where you live, and how far away you are from the resources we may recommend to you.

2 **I won't need this information after:** (mm/dd/yy)

(Note - we cannot help you if you need an answer in < 3 days. Click here if you are in a hurry)

3 **The Subject Area of the Question:** (click to see list -- choose one)

(None Selected)

4 **Please tell us your question.**
A human being will read your question -- please use complete sentences!
The more you tell us, the better our answer will be. What do you already know about your subject or question?

5 **How will you use this information? Why are you asking your question?**
If you're just curious, that's ok, but it really helps librarians to know this part! Sometimes we can use our subject knowledge and imaginations to think of other places to look for answers and information, if we know how you will use it or what you want to get out of the answer.

Will you use this information for a school assignment? ○ Yes ○ No

Are you: ☐ A librarian? ☐ A teacher? ☐ A businessperson?

6 **Type of answer preferred:** (choose one of the following)

○ A brief factual answer to your question
○ Some ideas for sources to consult for exploration:

☐ Internet sources ☐ Print sources ☐ I don't care which kind

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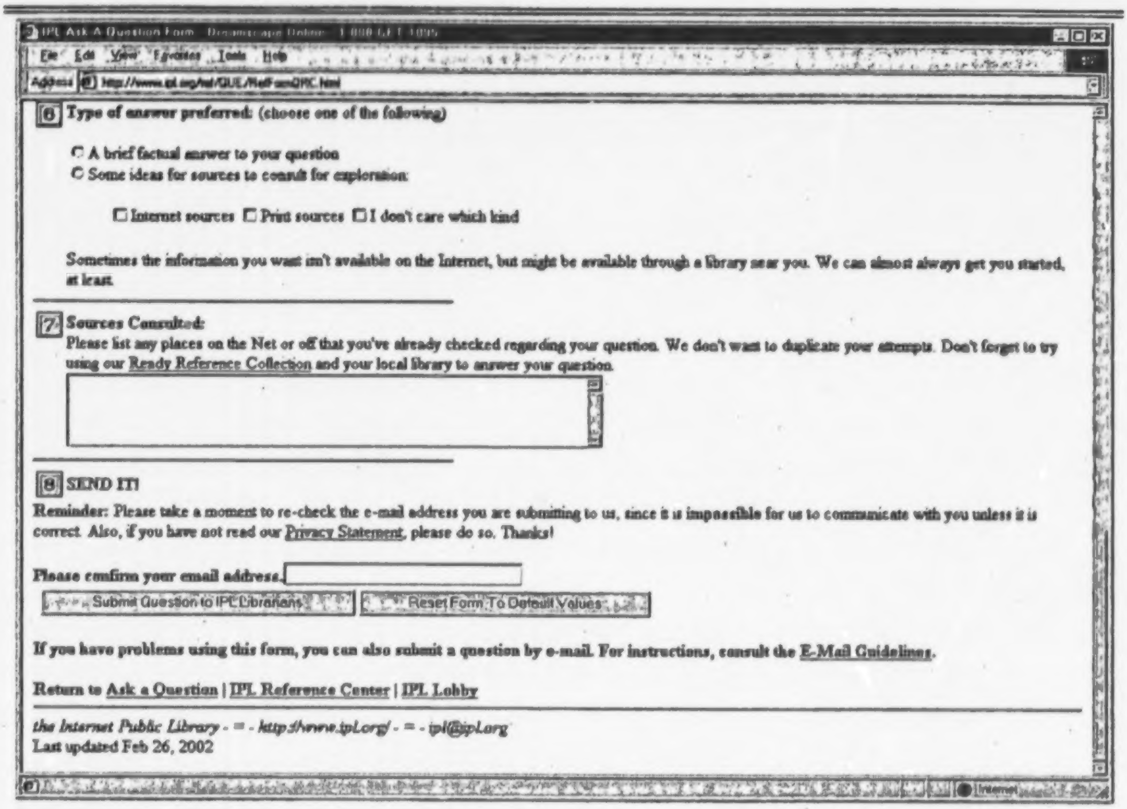
SAMPLE
A. Internet Public Library "Ask A Question" digital reference web submission form Continued
http://www.ipl.org/ref/QUE/RefFormQRC.html


IPL Ask A Question Form
File Edit View Favorites Tools Help
Address
Submit Question to IPL Librarians
Reset Form To Default Values
Internet

http://www.ipl.org/ref/QUE/RefFormQRC.html

6 Type of answer preferred: (choose one of the following)

○ A brief factual answer to your question
○ Some ideas for sources to consult for exploration:

☐ Internet sources ☐ Print sources ☐ I don't care which kind

Sometimes the information you want isn't available on the Internet, but might be available through a library near you. We can almost always get you started, at least.

7 Sources Consulted:
Please list any places on the Net or off that you've already checked regarding your question. We don't want to duplicate your attempts. Don't forget to try using our Ready Reference Collection and your local library to answer your question.

8 SEND IT!
Reminder: Please take a moment to re-check the e-mail address you are submitting to us, since it is impossible for us to communicate with you unless it is correct. Also, if you have not read our Privacy Statement, please do so. Thanks!

Please confirm your email address:

If you have problems using this form, you can also submit a question by e-mail. For instructions, consult the E-Mail Guidelines.

Return to Ask a Question | IPL Reference Center | IPL Lobby

the Internet Public Library - = - http://www.ipl.org/ - = - ipl@ipl.org
Last updated Feb 26, 2002

76

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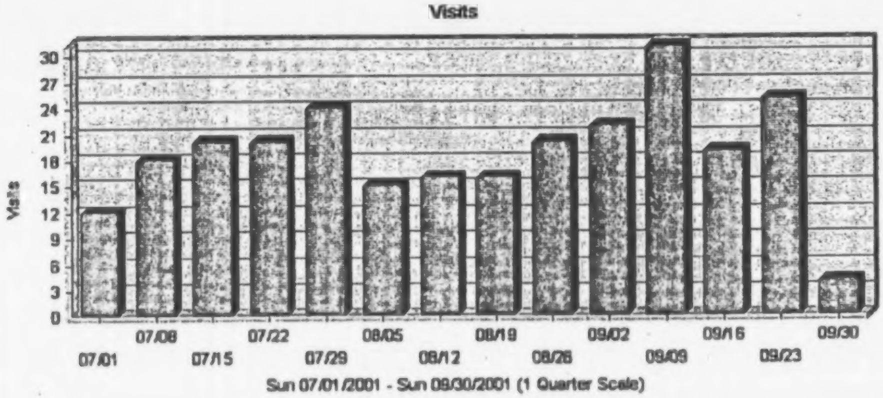
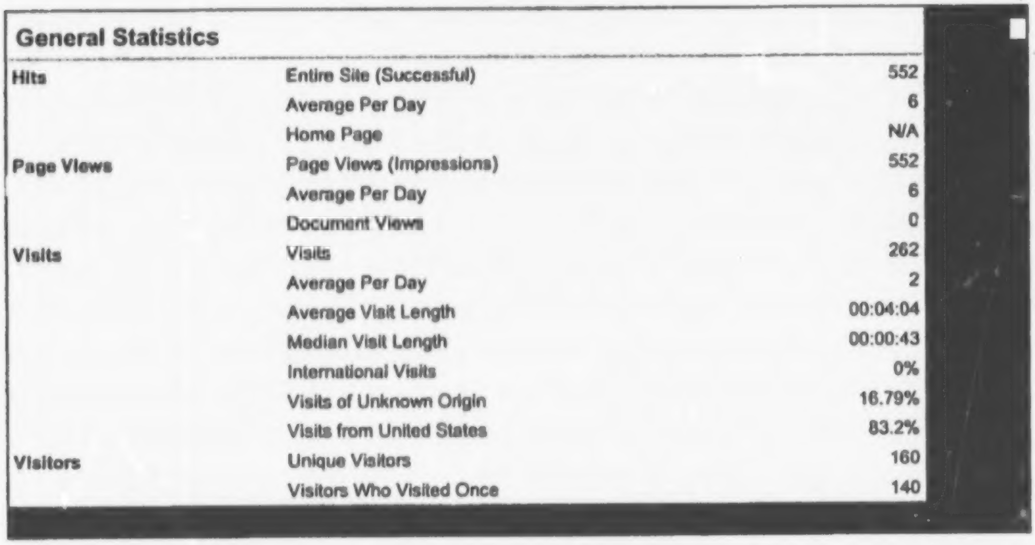
SAMPLE
B. Sample Webtrends Report – General Statistics

WEBTRENDS

The Visits graph displays the overall number of visits to your Web site. The General Statistics table provides an overview of the activity for your Web site during the specified time frame.





General Statistics

Hits	Entire Site (Successful)	552
	Average Per Day	6
	Home Page	N/A
Page Views	Page Views (Impressions)	552
	Average Per Day	6
	Document Views	0
Visits	Visits	262
	Average Per Day	2
	Average Visit Length	00:04:04
	Median Visit Length	00:00:43
	International Visits	0%
	Visits of Unknown Origin	16.79%
	Visits from United States	83.2%
Visitors	Unique Visitors	160
	Visitors Who Visited Once	140

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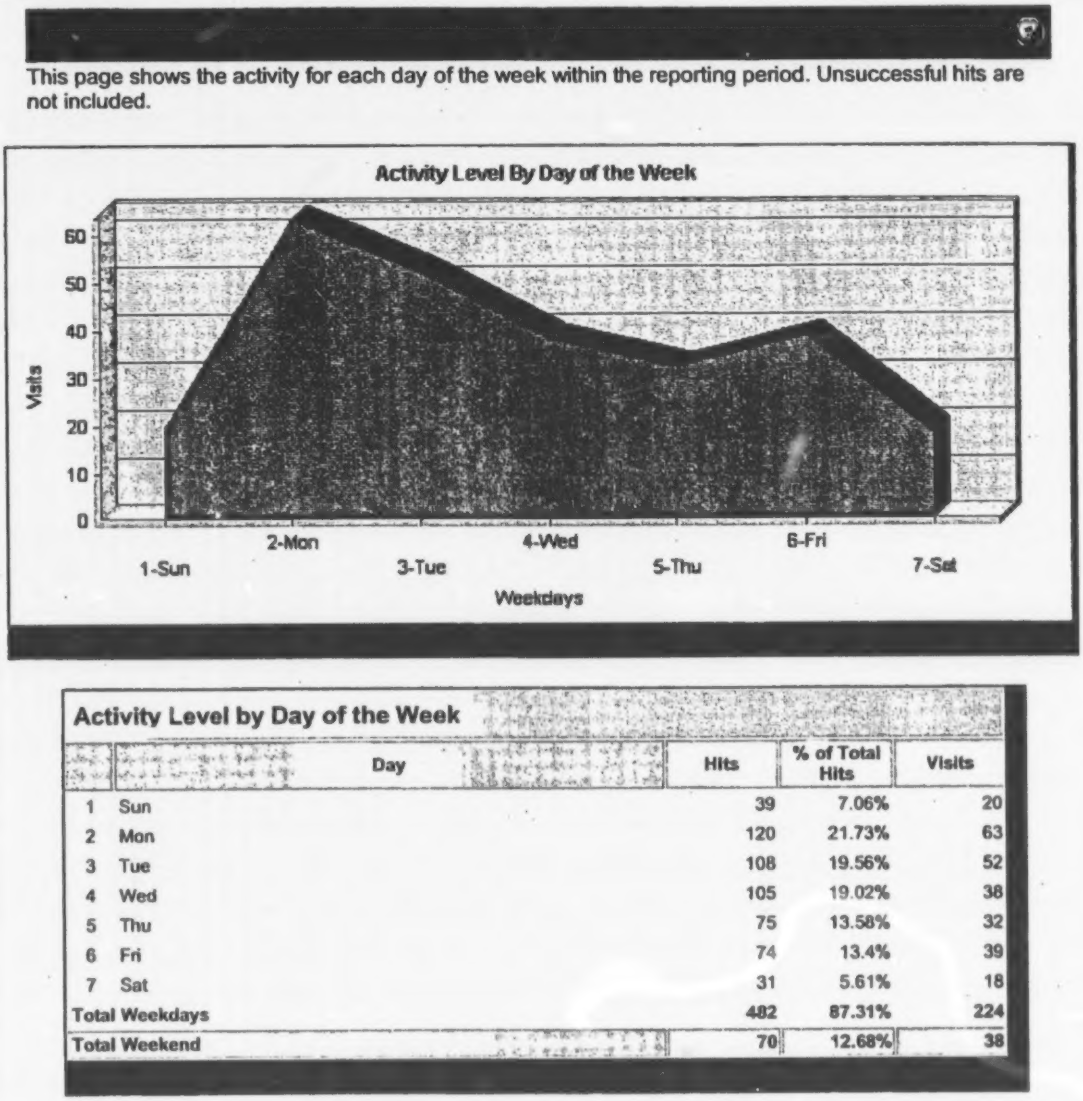
SAMPLE
C. Sample Webtrends Report – Activity Level By Day of Week



This page shows the activity for each day of the week within the reporting period. Unsuccessful hits are not included.

Activity Level By Day of the Week

Visits
0
10
20
30
40
50
60
1-Sun
2-Mon
3-Tue
4-Wed
5-Thu
6-Fri
7-Sat
Weekdays

Activity Level by Day of the Week

	Day	Hits	% of Total Hits	Visits
1	Sun	39	7.06%	20
2	Mon	120	21.73%	63
3	Tue	108	19.56%	52
4	Wed	105	19.02%	38
5	Thu	75	13.58%	32
6	Fri	74	13.4%	39
7	Sat	31	5.61%	18
Total Weekdays		482	87.31%	224
Total Weekend		70	12.68%	38

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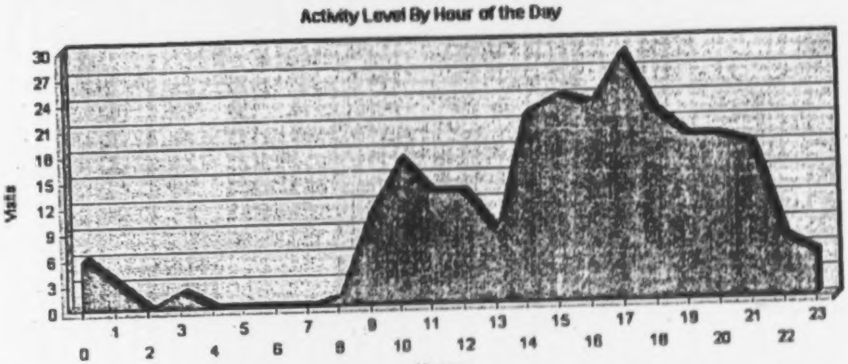
SAMPLE
D. Sample Webtrends Report – Activity Level by Hour of Day



Activity Level by Hours Details

Hour	# of Hits	% of Total Hits	# of Visits
00:00 – 00:59	12	2.17%	6
01:00 - 01:59	4	0.72%	3
02:00 - 02:59	0	0%	0
03:00 - 03:59	3	0.54%	2
04:00 - 04:59	0	0%	0
05:00 - 05:59	0	0%	0
06:00 - 06:59	0	0%	0
07:00 - 07:59	0	0%	0
08:00 - 08:59	5	0.9%	1
09:00 - 09:59	38	6.88%	11
10:00 - 10:59	56	10.14%	17
11:00 - 11:59	37	6.7%	13
12:00 - 12:59	20	3.62%	13
13:00 - 13:59	14	2.53%	8
14:00 - 14:59	42	7.6%	22
15:00 - 15:59	54	9.78%	24
16:00 - 16:59	46	8.33%	23
17:00 - 17:59	58	10.5%	29
18:00 - 18:59	48	8.69%	22
19:00 - 19:59	35	6.34%	19
20:00 - 20:59	29	5.25%	19
21:00 - 21:59	29	5.25%	18
22:00 - 22:59	14	2.53%	7
23:00 - 23:59	8	1.44%	5
Total Visitors during Work Hours (8:00am-5:00pm)	312	56.52%	132
Total Visitors during After Hours (5:01pm-7:59am)	240	43.47%	130

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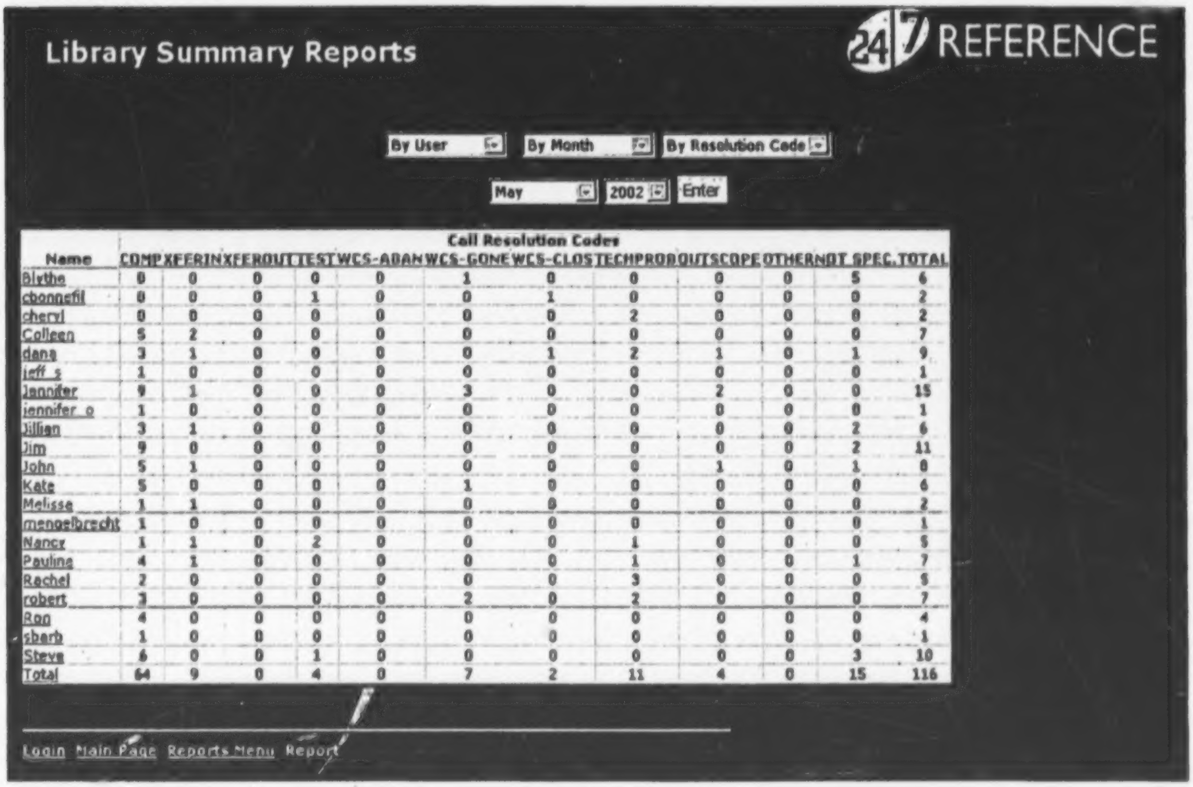
SAMPLE
E.Sample Summary Report from 24/7 Reference Software


Library Summary Reports
24/7 REFERENCE
By User
By Month
By Resolution Code
May
2002
Enter
Login
Main Page
Reports Menu
Report

Name	Call Resolution Codes											
	COMP	XFERIN	XFEROUT	TEST	WCS-ABAN	WCS-GONE	WCS-CLOS	TECHPROB	OUTSCOPE	OTHER	NOT SPEC.	TOTAL
Blythe	0	0	0	0	0	1	0	0	0	0	5	6
cbonnefil	0	0	0	1	0	0	1	0	0	0	0	2
cheryl	0	0	0	0	0	0	0	2	0	0	0	2
Colleen	5	2	0	0	0	0	0	0	0	0	0	7
dana	3	1	0	0	0	0	1	2	1	0	1	9
jeff_s	1	0	0	0	0	0	0	0	0	0	0	1
Jennifer	9	1	0	0	0	3	0	0	2	0	0	15
jennifer_o	1	0	0	0	0	0	0	0	0	0	0	1
Jillian	3	1	0	0	0	0	0	0	0	0	2	6
Jim	9	0	0	0	0	0	0	0	0	0	2	11
John	5	1	0	0	0	0	0	0	1	0	1	8
Kate	5	0	0	0	0	1	0	0	0	0	0	6
Melisse	1	1	0	0	0	0	0	0	0	0	0	2
mengelbrecht	1	0	0	0	0	0	0	0	0	0	0	1
Nancy	1	1	0	2	0	0	0	1	0	0	0	5
Pauline	4	1	0	0	0	0	0	1	0	0	1	7
Rachel	2	0	0	0	0	0	0	3	0	0	0	5
robert	3	0	0	0	0	2	0	2	0	0	0	7
Ron	4	0	0	0	0	0	0	0	0	0	0	4
sbarb	1	0	0	0	0	0	0	0	0	0	0	1
Steve	6	0	0	1	0	0	0	0	0	0	3	10
Total	64	9	0	4	0	7	2	11	4	0	15	116

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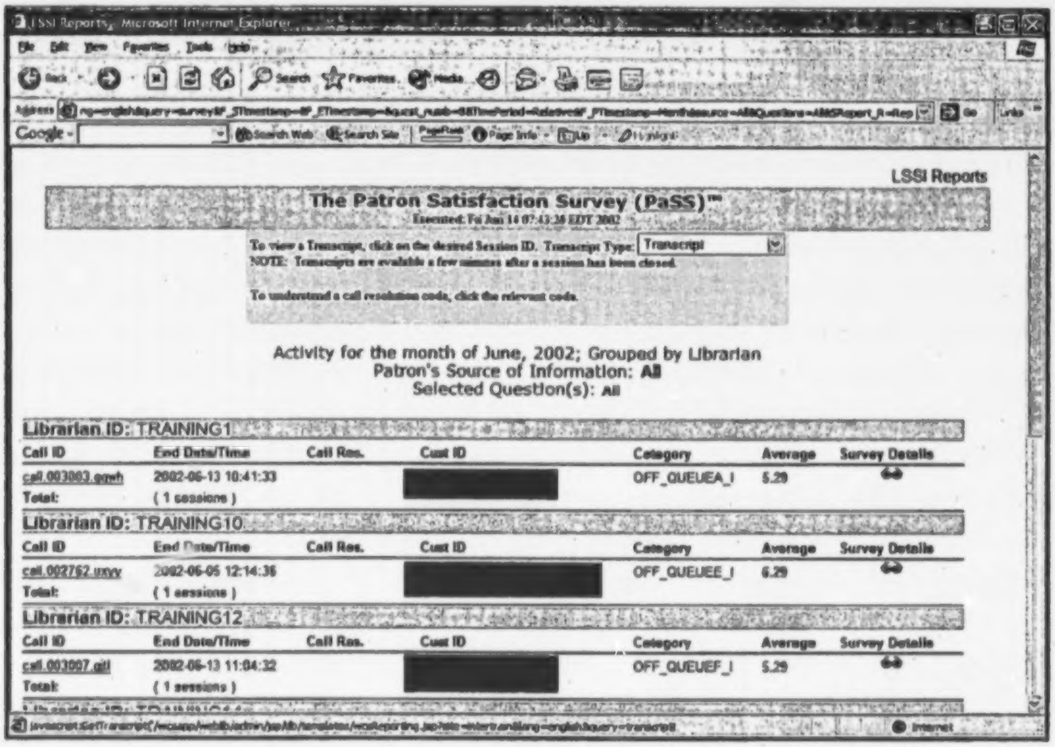
SAMPLE
F. Sample User Satisfaction Transcripts and Reports from LSSI's Virtual Reference


LSSI Reports - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address
Go Links
Google Search Web Search Site PageRank Page Info Up Highlight
Internet

LSSI Reports

The Patron Satisfaction Survey (PaSS)™
Executed: Fri Jun 14 07:43:38 EDT 2002

To view a Transcript, click on the desired Session ID. Transcript Type: Transcript
NOTE: Transcripts are available a few minutes after a session has been closed.

To understand a call resolution code, click the relevant code.

Activity for the month of June, 2002; Grouped by Librarian
Patron's Source of Information: All
Selected Question(s): All

Librarian ID: TRAINING1

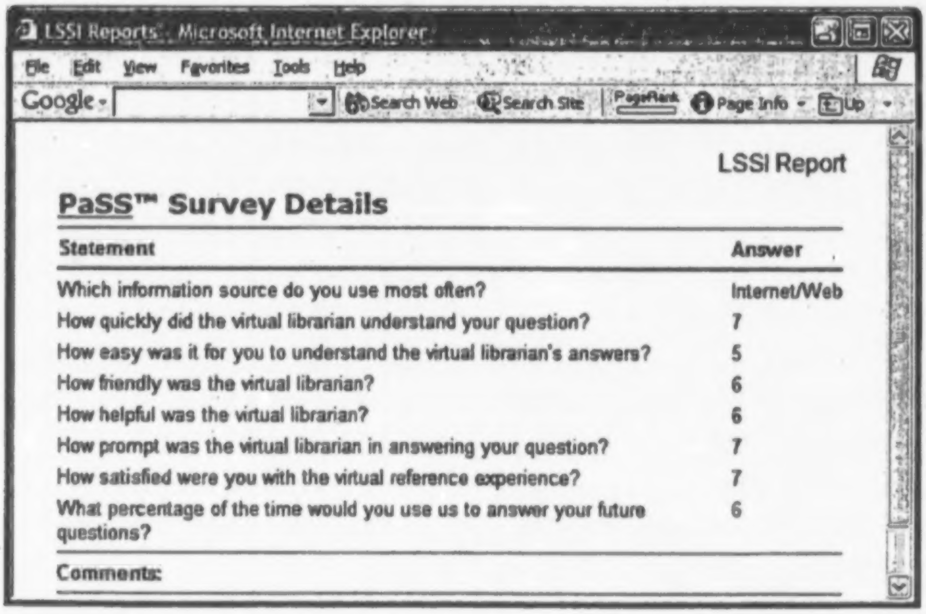
Call ID	End Date/Time	Call Res.	Cust ID	Category	Average	Survey Details
call.003003.gqwh	2002-06-13 10:41:33		[redacted]	OFF_QUEUEA_I	5.29	👓
Total:	(1 sessions)					

Librarian ID: TRAINING10

Call ID	End Date/Time	Call Res.	Cust ID	Category	Average	Survey Details
call.002762.uxyy	2002-06-05 12:14:36		[redacted]	OFF_QUEUEE_I	6.29	👓
Total:	(1 sessions)					

Librarian ID: TRAINING12

Call ID	End Date/Time	Call Res.	Cust ID	Category	Average	Survey Details
call.003007.gitl	2002-06-13 11:04:32		[redacted]	OFF_QUEUEF_I	5.29	👓
Total:	(1 sessions)					


LSSI Reports - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Google Search Web Search Site PageRank Page Info Up

LSSI Report

PaSS™ Survey Details

Statement	Answer
Which information source do you use most often?	Internet/Web
How quickly did the virtual librarian understand your question?	7
How easy was it for you to understand the virtual librarian's answers?	5
How friendly was the virtual librarian?	6
How helpful was the virtual librarian?	6
How prompt was the virtual librarian in answering your question?	7
How satisfied were you with the virtual reference experience?	7
What percentage of the time would you use us to answer your future questions?	6

Comments:

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SAMPLE
G. Sample Chat Transcription from LSSI Virtual Reference

TAMSIN Bolton's Virtual Reference Transcript from the University of Winnipeg Library
Winner LSSI's Samuel Swett Green Award for Best Virtual Reference Transcript 5/15/02
All personal information has been removed to protect the privacy of the patron

---

Submit No: 00004
Name:
Library:
Position:
TelephoneNumber:
PatronWaitingTime: No wait
NumberOfInquirers: 1
Transcript: General Chat Info
Chat start time 11:36:39 04/15/2002
Chat end time 12:27:36 04/15/2002
Duration (actual chatting time) 00:50:43

Chat Transcript

info: Please wait for a site operator to respond.
info: You are now chatting with 'TAMSIN'

TAMSIN: Hi there, how can I help you?
VISITOR: Hi, TAMSIN, my name is * and i was just chatting with * about XXXX [database vendor name]. i don't know how to access the articles she helped me find
TAMSIN: okay, did she e-mail them to you or are you just trying to get At them in XXXX [database vendor name]?
VISITOR: i'm trying to access them from home, she offered to email them, but i'm trying to familiarize myself with the process to use it as a resource. when i click on full text, etc, it doesn't bring up the articles. can i not view them and print them?
VISITOR: maybe i don't have the proper software, is that possible?
TAMSIN: yes you certainly should be able to view them. Are you by any chance clicking on a link that says "full page image"?
VISITOR: when i tried to download the article from its current location, it said there was no path, yes i did try full page image, what now?
TAMSIN: Well, full page image requires that you have software called "acrobat reader" installed on your computer. If you are not able to read the file it is possible your don't have acrobat reader- you can easily install it right now if you want though
VISITOR: i don't know if it will fit, does it require a lot of space? i'm so ignorant of the techincal world, i don't even know how to check how much space i have
TAMSIN: umm, it shouldn't require too much space. But it can sometimes take a bit of time to download. Do you have a high speed internet connection?
VISITOR: i'm connected to the u of w free internet service, on a Compaq 586 that was built in 1995!

SAMPLE
G. Sample Chat Transcription from LSSI Virtual Reference Continued

VISITOR: the time doesn't really matter, i just don't know if it will work
TAMSIN: oh my:-). well, that might take a bit of time then. If you aren't concerned about time then you could try to download it but, like you, I am not sure how well the program would run with your computer
TAMSIN: was "full page image" the only full text link you saw?
VISITOR: hang on, i'm just checking
TAMSIN: because XXXX [database vendor name] does sometimes offer different formats of full text
TAMSIN: full page image" is the only version that requires seperate software
VISITOR: some of the articles have different options. some have all "full page image" and "full text" and "XML full text", others only have two of those options, still others a combination
VISITOR: which one should i choose?
TAMSIN: if you click on "full text" you should see the text on your Screen without any seperate software
VISITOR: i'm going to try that, can you hang on while i try that?
TAMSIN: sure thing, I'll be right here
VISITOR: it takes me to a page that says refine search result list, This is where i don't know what to choose
VISITOR: there is an option that says "go to citation", is this what I click on?
TAMSIN: Are you looking at your list of results right now?
VISITOR: no, i clicked on one of my results and it took me to this Results page. i'm going to try clicking on the citation, i'll be right back
VISITOR: nothing is happening when i click on citation
TAMSIN: okay- do you think you could tell me the name of the article You are at?
VISITOR: it wasn't anything specific, just an article that had the Option of full text, i have to check what it was . . .
TAMSIN: Well, from here, when I click on full text I see the article on my screen and that link "go to citation" is in the top right corner. But you are not seeing the full text, is that right?
VISITOR: yes
TAMSIN: hmmm, this is a pickle...
VISITOR: i don't see the article though
VISITOR: that's exactly what i said to *
TAMSIN: Let's just test something out- pick any article from your list that says it has full text. I'll look at it here at see if I have any trouble
VISITOR: it's the attack on human rights, by Michael Ignatieffk, Foreign Affairs, nov/dec, 2001
TAMSIN: okay- I'll check it out
VISITOR: that's supposed to read Ignatieff without the "k"
TAMSIN: Okay, I've got it. So if you click on the title of that Article and scroll down, you don't see the article? Am I right?
VISITOR: you're right

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SAMPLE

G. Sample Chat Transcription from LSSI Virtual Reference Continued

TAMSIN: yikes! I think that pickle comment I made may be an understatement:-). You should be able to see the full text on your screen and I am really not sure why you are not.

TAMSIN: I know you wanted to figure this out yourself but I am still Very willing to e-mail you some articles if you want

TAMSIN: and in the meantime I can try to figure out why you may not be able to view the full text

VISITOR: you're awesome. i guess i will have to take some time after The term to get this whole cybrary thing figured out. do you have an email address and i can mail you a list of what i need? i need to take the time to choose the articles, twelve in all. meanwhile, should i try to down load acrobat, and how do i do that?

TAMSIN: sure, you can e-mail me at t.bolton@uwinnipeg.ca - and I'll Send you to the page to get acrobat reader right now

VISITOR: how are you sending that?

TAMSIN: one sec.- it should appear on your screen like magic...

VISITOR: you are so funny!

TAMSIN: http://www.adobe.com/products/acrobat/readstep2.html

TAMSIN: ta-da

TAMSIN: do you see the instructions?

VISITOR: you are so magical, it's here and you are fabulous. thanks For your email, i will chat with you later. i can't thank you enough for taking the time, you guys are all really awesome, so awesome in fact, you can have my firstborn, she's driving me crazy

TAMSIN: okay, * is here with me and she wants to test something out With you- do you have a minute?

VISITOR: i have lots of minutes

TAMSIN: The Attack on Human Rights.

TAMSIN: when you click on the title can you see the fulltext?

VISITOR: i'm stuck in XXXX [database vendor name], then only thing i see now is return to Top and when i click, it won't do anything, should i try to get back in, i'm turning in to a nightmare, aren't i?

VISITOR: ok, i misunderstood, i will click on your link

TAMSIN: ok

VISITOR: now i'm on XXXX [database vendor name] publishing login page and it is asking me for an id and password

VISITOR: what now?

TAMSIN: Okay, our test didn't work. Let's just stick to our other plan- you e-mail me with the articles you need and I'll e-mail you back the text. Sound good?

VISITOR: sounds good, i'm also going to fool around with the acrobat Thing and try a couple of things from here. i'll email you to let you know where i'm at. thanks again, talk to you later

TAMSIN: sure thing- good luck and yes, talk to you later:-)

#30#

SAMPLE

H. Sample Digital Reference Transaction Record

NOTE: This sample form is intended to serve as basis for developing a form that is most useful to your library or organization. It is not intended that this form be copied and used as is. Some of the features and questions on this form will be useful in some situations and not in others. It is not expected that you will use all the elements of this form. It is comprehensive so that you may see what questions you might use in creating your own form. The form you develop may be a print form or developed into a database or spreadsheet.

Digital Reference Question Transaction Record

Instructions: Complete a separate form for each digital reference question received.

Date Question Sent from User__________ Time Question sent___________
Day and Date Received________________ Time Received________________
Date Completed________________ Time Completed________________
Total Transaction time___________

Question received by: (check appropriate media) Staff member_______________

email__ chat___ webform__ VoIP___ Interactive video____ instant message______

User Information

User Name____

User contact information/email address

____

User demographic information (enter appropriate demographic information for your situation):

Is this patron a repeat user? **Y N** Reason for repeat use_____________________________________

User's Question Information

User's Reference Question____

Additional information regarding question:

____

____

____

Type of reference question (i.e. ready reference, instructional, subject request? etc):

Date information needed by___________________ RUSH?_________________

Delivery preference?____

SAMPLE

H. Sample Digital Reference Transaction Record Continued

Does the user have any requirements regarding format of answers or responses? Y N

If yes please specify (.doc .pdf, .xls, etc.): ______________________________

Magazine or journal articles only?	Y N	Full - text only?	Y N
Citations/Abstracts acceptable?	Y N	Web info acceptable?	Y N
Email attachments OK?	Y N		

Does the patron have any specific requirements/limitations regarding type of website or other resources (i.e. peer-reviewed, specific domains, government information, primary resource materials only, etc)? Y N

Specify:____

User's Browser_________________ User's Platform_____________

What other sources, if any, has the user tried? ______________________________

____

Staff Responses/Answer

Were you able to answer the user's question? Y N

Describe the nature of the answer provided to the user:

____

What resources did you use to answer this question? (for checklist, check all that apply)

____

____

Free_______ Staff-Created_____ Proprietary ______ Traditional ______ Other________

Did you refer this question? Y N If Yes, Internal? _____ External?__________

Where did you refer the user? ____

Reason for referral____

Would you have been able to answer this question? Y N

If yes, why did you give a referral?______________________________________

Total digital responses ______________ Were any non-digital responses made? Y N

NOTE : If non-digital responses were made-do not include this question as a digital reference question

SAMPLE

Digital Reference Data Collection Worksheet

I. Digital Reference Question Transaction Log – For libraries providing email digital reference service

This transaction log is for use primarily by those libraries that provide both traditional and digital reference service (where the digital reference service is primarily email based). Use this log in conjunction with the Digital Reference Transaction Record to keep track of all digital reference transactions.

Name of Staff Member ________________________________

Question	User	Date/Time Initial Email Sent	Date/Time Initial Email Rec'd	Date/Time Digital Reference Transaction Completed	Total Time	Type
EXAMPLE Latest population of Bolivia	Amgad E.	7/5/02 10:05 a.m.	7/5/02 10:12 a.m.	7/5/02 10:31 a.m.	26 minutes	ready reference
Author of the short story "Midnight Express"	Sebastian S.	7/5/02 10:09 a.m	7/5/02 10:32 a.m	7/5/02 10:41 a.m.	31 minutes	bibliographic
TOTAL: 2					**57 minutes**	

SAMPLE

Digital Reference Data Collection Worksheet

J. Reference Question Transaction Log – For libraries providing real-time digital reference service

Question	User	Date/Time(s) Initial Session requested	Date/Time(s) Initial Session honored	Date/Time Final Session Completed	Total Time	Type
EXAMPLE How lighthouses work	Anna Maria L.	9/16/02 1:02 p.m.	9/16/02 1:03 p.m.	9/16/02 1:15 a.m.	13 min.	ready reference
competency modeling	Frank D.	9/16/02 2:16 p.m.	9/16/02 2:16 p.m	9/16/02 3:14 a.m.	58 min.	research
TOTAL					71 min.	

SAMPLE
Digital Reference Data Collection Worksheet
K. Total Reference Activity Log – Daily / Two Week Period

Total Reference Activity Log – Daily

Date______________________ **Staff Member**______________________

TRANSACTION	Mark each of transaction in the space below	TOTAL
Digital	𝍸 ||||	
Hybrid *	𝍸 ||	
Traditional	𝍸	

NOTE: Hybrid Reference Transactions are those transactions which are submitted digitally but which are responded to or answered by non-digital means as defined in *Measure 4*.

Total Reference Activity Log – Two Week Period

Date	Digital	Hybrid*	Traditional	Total
Total				

NOTE: Hybrid Reference Transactions are those transactions which are submitted digitally but which are responded to or answered by non-digital means as defined in *Measure 4*.

SAMPLE
Digital Reference Data Collection Worksheet
L. Digital Reference Completion Time Calculation Worksheet

Sample Period ________________________________

Total Number of Digital Reference Question
Add totals from all Digital Reference Transaction Logs – email and/or real time. * ______________

Total Completion Time
Convert times from Digital Transaction Record to minutes.
Enter onto Digital Reference Transaction Log – email and/or real time.
Add total of all minutes from all Digital Reference Transaction Logs. ______________

Average Completion Time

______________	÷	______________	=	☐
Total Completion Time in Minutes		Total Number of Digital Reference Questions		Average Completion Time

*** NOTE:** **Only include questions that are Digital Reference Questions as defined in *Measure 1-Digital Reference Questions Received.***

Convert all time units to minutes

1 hour = 60 minutes
1 day = 1440 minutes

SAMPLE

Digital Reference Data Collection Worksheet

M. Sample Digital Reference – Data Collection Worksheet – Compilation of Descriptive Statistics and Measures

Today's Date__________ Assessment period_____________ Person completing form________________

NOTE: The table below includes those descriptive statistics and measures in which the results are tabulated with a numerical value. *Measure 10 – Types of Digital Reference Questions Received* and *Measure 13 – Sources Used Per Question*, which require more than a numerical result, have their own sample worksheets.

Measure	Calculation	Results
1. Number of Digital Reference Questions Received	Count the number of digital reference questions received.	
2. Number of Digital Reference Responses	Count the number of digital responses made.	
3. Number of Digital Reference Answers	Count the number of digital reference answers given.	
4. Number of questions received digitally but not answered or responded to by completely digital means.	Count the number of questions received digitally but not answered or responded to by completely digital means.	
5. Total Reference Activity-Questions Received	Add the number of digital questions received, the number of "hybrid" questions received and the number of traditional questions received.	
6. Percentage of Digital Reference Questions to Total Reference Questions	Divide the number of digital reference questions received by the total from *Measure 5* and multiply by 100.	
7. Digital Reference Correct Answer Fill Rate	Divide the number of correct answers by the total number of questions asked and multiply by 100.	
8. Average Completion Time	Add the total time taken to answer the digital reference questions and divide by the number of digital reference questions.	
9. Number of Unanswered Digital Reference Questions	Count the number of unanswered digital reference questions during the assessment period.	
11. Total Number of Referrals	Count the total number of referrals- include internal and external referrals.	
12. Saturation Rate	Divide the number of digital reference service users by the total target population and multiply by 100.	
14. Repeat Users	Count the number of repeat users.	

SAMPLE
Digital Reference Data Collection Worksheet

N. Type of Digital Reference Question Received

Measure 10 – Type of Digital Reference Questions Received

Today's Date__________ Assessment period____________ Person completing form_______________

In the following chart indicate the number of each type of digital reference question received during the assessment period.

Type of Digital Reference Question Received	Number Received
Bibliographic	
Instructional	
Literature Search	
Reader's Advisory	
Ready Reference	
Research or Subject Request	
Technical	
Other	
Out of Scope	

NOTE: If a reference question fits more than one category count it as "Other".

SAMPLE
Digital Reference Data Collection Worksheet
O. Sources Used Per Question

Measure 13 – Sources Used Per Question

Today's Date__________ Assessment period_____________ Person completing form________________

Use this worksheet if you are using the option to categorize the sources used per question as outlined in the manual.

Type of Source Used to Answer Digital Reference Question	**Number of times source used**
Free (electronic)	
Staff-Created (electronic) *	
Proprietary or vendor based (electronic)	
Traditional (information sent electronically)	
Other	

* Count staff created resources only once here. Do not also count under "Free"

If you are recording the specific source used for each question, record this detailed information on the Digital Reference Transaction Form. Indicate below which sources have been used during the assessment period and the number of times used. Use the level of detail most meaningful for you. The first entries are examples.

Source Used	Number of times used
e.g.: WorldCat	
e.g.: S&P NetAdvantage	
e.g.: EBSCO Business Source	

SAMPLE
Digital Reference Data Collection Worksheet

P. Log Analysis – Number of Digital Reference Sessions – Real Time

Today's Date__________ Assessment period____________ Person completing form_______________

Measure 15 – Number of Digital Reference Sessions

Number of Digital Reference Sessions – Requested	

Number of Digital Reference Sessions – Honored	

NOTE: Different real-time software programs and electronic logs may have meanings for the term "sessions" or may have different terminology that means the same thing as sessions. A session is defined in a real-time setting as one continuous active time of connection between the user's software and the service software. Generally such sessions will take place using any of the following real time services: chat, instant messenger, interactive video or "voice over IP." A session may not necessarily represent the entire period that it takes to answer a digital reference question.

In some cases it may be helpful to know both the number of sessions requested (i.e., the user logs on to the service and requests a session) and number of sessions honored (i.e., the digital reference service staff member acknowledges the request).

For greater information about the time to answer questions, it may also be helpful to note the average time that it takes for the session requests to be honored.

SAMPLE
Digital Reference Data Collection Worksheet

Q. Log Analysis – Usage by Day of the Week / Usage by Time of the Day

Today's Date__________ Assessment period_____________ Person completing form________________

Measure 16 – Usage of Digital Reference Service by Day of the Week

Day of the week	Usage
Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

NOTE: Data from this chart can be plotted on a graph or displayed on a chart using spreadsheet software.

Measure 17 – Usage of Digital Reference by Time of Day

Please note that you may need to convert from military time to conventional time.

Time of Day A.M.	Usage	Time of Day P.M	Usage
Midnight -12:59 a.m.		Noon – 12:59 p.m.	
1:00 - 1:59 a.m.		1:00 - 1:59 p.m.	
2:00 - 2:59 a.m.		2:00 - 2:59 p.m.	
3:00 - 3:59 a.m.		3:00 - 3:59 p.m.	
4:00 - 4:59 a.m.		4:00 - 4:59 p.m.	
5:00 - 5:59 a.m.		5:00 - 5:59 p.m.	
6:00 - 6:59 a.m.		6:00 - 6:59 p.m.	
7:00 - 7:59 a.m.		7:00 - 7:59 p.m.	
8:00 - 8:59 a.m.		8:00 - 8:59 p.m.	
9:00 - 9:59 a.m.		9:00 - 9:59 p.m.	
10:00 - 10:59 a.m.		10:00 - 10:59 p.m.	
11:00 - 11:59 a.m.		11:00 - 11:59 p.m.	

NOTE: Data from this chart can be plotted on a graph or displayed on a chart using spreadsheet software.

SAMPLE

Digital Reference Data Collection Worksheet

R. Log Analysis – User's Browser / User's Platform

Today's Date__________ Assessment period_____________ Person completing form________________

Measure 18 – User's Browser

Depending on need, this may be measured at the version level or simply by browser type.

Browser	Version Use	Browser Use
Internet Explorer		
Version:		
Version:		
Version:		
Netscape Navigator		
Version:		
Version:		
Version:		
AOL		
Version:		
Version:		
Version:		
Other: (please list)		

Measure 19 – User's Platform

User's Platform	Usage
Windows XP	
Windows 2000	
Windows Millennium	
Windows 98	
Windows 95	
Windows NT	
Macintosh OS	
Linux	
Other:	

SAMPLE
Digital Reference Data Collection
S. User Satisfaction Measures -Expectations for Service Sample Questionnaire

Measure 22 – Expectations for Service – Questionnaire to be used prior to digital reference transaction

Sample questionnaire to be filled out by the user at the beginning of the digital reference transaction or as part of a focus group or interview. This questionnaire can take the form of an email message sent by the staff as part of the reference interview process or can be integrated into the digital reference web submission form.

Please help us to improve our digital reference service by answering a few questions letting us know what your expectations are from the service.

1. What type of question do you have today?

2. In what format would you like your answers?

   Do you want only full-text articles? Yes______ No_______

   Will you accept citations and /or abstracts? Yes______ No______

   Would you like your answers sent as email attachments? Yes______No______

   Are there any other formats you would like your answer in?

   MS Word?________ .pdf? ________ other? ___________

   I'm not sure _________

3. How long do you expect us to take to answer your question? _________________

   Do you need to have your answer by a certain date or time? Yes_____ No______

   If yes, when?_________________

4. What are your expectations with regard to the answer you would like to receive from us?

SAMPLE
Digital Reference Data Collection
T. User Satisfaction Measures – Sample Survey/Questionnaire Questions

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The following questions may be useful when developing surveys, interviews, focus groups and questionnaires to determine user satisfaction.

Awareness of Service

How did you learn of our service?
Possibilities: From website
From signs in library
Word of mouth
From ad in magazine or journal
Recommended by another user
Flyers
Mailings
From an article
From TV or radio broadcast

Accessibility of Service

How accessible is our service?
How easy is our website (or other access point) to navigate?
Did you encounter any technical trouble in submitting your reference question?
Do you have any special visual or hearing needs?
What type of browser or operating system do you use?
When is the most likely time for you to use our service?
Did you have to wait a long time in the queue?
How long did it take for you to hear back from a staff member after you initially submitted your question?

Other Sources User Tried

What other sources have you used to obtain an answer to your question?
Have you used another digital reference service besides ours?
Please describe your experience with other sources you have tried or other reference services you have used.

Reasons for Use

Why did you try our service?
Have you used our service before?
If so, why are you using our service again?
Possible responses for checklist:

SAMPLE

Digital Reference Data Collection

T. User Satisfaction Measures Continued – Sample Survey/Questionnaire Questions

The service was great!
It is my only option because I am far from the library.
It is less work for me.
Service has access to resources I cannot afford on my own.
Personal service.
No photocopying fees.

What have you liked about the service? Please explain.

Reasons for Non Use

Are you aware of our service? (see also Awareness of Service section above)
If you are aware of our service is there a reason you have not used it?
Possible responses for a checklist
I do not have an information need.
I do not have access to email (web, chat, voice, video).
I do not know how to use email (web, chat, voice, video).
I expect it to be too impersonal.
I do not trust information from the Internet, online sources
My traditional reference service is fine.
I hate computers.
My reference questions are more complicated than what your service offers.
Service is not available when I need it.

Have you used our service before?
If so, why have you not used it again?
Possible responses for checklist:
I haven't had a subsequent need.
Terrible service the first time.
Scope of service was not what I expected.
Lack of face-to-face contact.
Too many technical difficulties.
Service was not available when I needed it.
Better service from another source.
Answer given previously was not complete, comprehensive or definitive enough.
I learned how to find the information on my own.
I learned how to search on my own as a result of help received from the service.

SAMPLE
Digital Reference Data Collection
T. User Satisfaction Measures Continued – Sample Survey/Questionnaire Questions

Improvements Needed/Additional Services Needed

How can we improve our service?
What improvements do you think are needed?
Are our hours and days convenient for your needs?
Do you feel that our scope of service is too narrow?
What types of questions that we do not answer now would you like to see us answer?
How was our turnaround time?
Was our service easy to use?
Do you have a special need that we are not able to address now?

Satisfaction With Staff

Did you find our staff helpful?
Did you find our staff knowledgeable?
Did you find our staff friendly?
Please rate the person who assisted you in terms of their attitude and demeanor.
Did you feel you received personalized service with our staff?
Do you feel that the staff responded to you in a timely way?
Was the staff helpful with any difficulties you may have had accessing our service?

Delivery Mode Satisfaction

Were you satisfied with the manner in which your answer was delivered?
Were you expecting some other mode of delivery?
Would you like us to add any other modes of delivery? (see also Improvements/Additional Services Needed.)

Impact of Service on User

Has our service had an impact on you?
Please describe in detail how our service has impacted your life, career, educational process, creativity, etc.

SAMPLE
Digital Reference Data Collection Worksheet
U. Cost Worksheet

Worksheet for determining cost of Digital Reference Service

This worksheet provides suggestions only for factors to include when determining cost. These factors may differ depending on the type of digital reference service you provide. For libraries that have a digital reference service that is completely integrated with their regular reference service, an accurate breakdown may be difficult. In many cases digital reference cost will need to be prorated out from total reference costs if budgetary details are not kept at the level required. Though this aspect of assessment may be difficult, it is better to do some analysis rather than none.

Cost Factor	Monthly Cost
Staff salary and benefits (prorated if necessary)	
Training or tuition expenses	
Telecommunication charges (prorated)	
Hardware – initial purchase and upgrades	
Technical support charges	
Software – initial purchase (prorated if necessary)	
Software – upgrades (prorated if necessary)	
Database licenses (prorated if necessary)	
Technical support charges	
Advertising expenditures	
Utilities– heating & electricity (prorated if necessary)	
Lease, mortgage or rental (prorated if necessary)	
Print resources (prorated if necessary)	
Support materials – manuals, etc.	
Website hosting fees, domain name fees (prorated if necessary)	
Supplies	
Other:	
Other:	
TOTAL	

SAMPLE
Digital Reference Data Collection Worksheet
V. Cost – Electronic Resources Prorate Worksheet

This worksheet is used to determine cost of use of online resources by the digital reference staff, when those resources are also used by other library staff, users within the library, and remotes users. If you are using weblog software, you may be able to determine the number of sessions initiated from the digital reference staff workstations.

Fee-based Online Resource	Total Cost	Percent Used by Digital Reference Service	Digital Reference Service Cost
Ex. EBSCOHost	$74,000	7% or .07	5,180
TOTAL		▨	

SAMPLE
Digital Reference Data Collection Worksheet
W. Cost of Digital Reference as Percentage of Total Reference / Total Library Budget

---

Worksheet for *Measure 32 – Cost of Digital Reference as Percent of Total Reference Budget*

A. Cost of Digital Reference Service
(see worksheets U / V for Cost of Digital Reference Service) $__________________

B. Total Reference Budget $__________________

______________ ÷ ________________ = ________________

A. Digital Reference Cost B. Total Reference Budget C.

______________________ X 100 = __________%
C. (from above)

Worksheet for *Measure 33 – Cost of Digital Reference as Percent of Total Library Budget or Organizational Budget*

A. Cost of Digital Reference Service
(see worksheets U / V for Cost of Digital Reference Service) $__________________

B. Total Library/Organization Budget $__________________

______________ ÷ ________________ = ________________

A. Digital Reference Cost B. Total Lib/Org Budget C.

______________________ X 100 = __________%
C. (from above)

SAMPLE
Digital Reference Data Collection Worksheet
X. Staff Time Expended – Percent of Time Overseeing Technology

Measure 34 – Percent of Staff Time Overseeing Technology

Today's Date__________ Assessment period_____________ Person completing form________________

Table 1

Activity Involving Overseeing Technology	Time spent
Creating, maintaining and updating digital reference resources	
Creating, maintaining and updating digital reference website	
Downloading and installing software updates	
Diagnosing and correcting hardware problems	
Diagnosing and correcting software problems	
Learning to use software used for digital reference (i.e., chat, email, interactive voice and video, digital reference software)	
Learning to use electronic resources (proprietary databases, web-based resources)	
Conducting evaluation and assessment	
Other:	
Total Time Spent Overseeing Technology	

Table 2

Total Time Spent for Digital Reference	

Formula

$$\frac{\text{Total staff time spent overseeing technology (Table 1)}}{\text{Total staff time spent for digital reference (Table 2)}} \times 100 = \_\_\_\_\_\_\%$$

SAMPLE
Digital Reference Data Collection Worksheet
Y. Staff Time Expended – Percent of Time Assisting Users with Technology

Measure 35 – Percent of Staff Time Assisting Users With Technology

Today's Date__________ Assessment period____________ Person completing form______________

Table 1

Activity Assisting Users With Technology	**Time spent**
Teaching user how to access or use online databases	
Teaching user how to download software (such as Adobe Acrobat Reader or required plug-ins)	
Importing results into another application (e.g. MS Excel, or bibliography software)	
Teaching users how to open, save and download email attachments	
Diagnosing and correcting software problems on the user's end	
Teaching users how to use chat or interactive voice and video software to utilize reference service	
Teaching users important features of browsers or platform	
Other:	
Total Time Spent Assisting Users with Technology	

Table 2

Total Time Spent For Digital Reference	

Formula

$$\frac{\textbf{Total staff time spent assisting users with technology (Table 1)}}{\textbf{Total staff time spent for digital reference (Table 2)}} \times 100 = \_\_\_\_\_\%$$

APPENDIX II

OTHER STATISTICS AND MEASURES CONSIDERED FOR THIS MANUAL

The study team considered many statistics and measures for inclusion in this manual. Those selected for full description (see Chapter 2) came from suggestions from the advisory committee, the literature, the site visits, and the authors' experience in this area. During the study, however, some statistics and measures evolved from study team discussions, additional input from the advisory committee and previous research. The study team was not able to detail these "potential" statistics and measures, nor were we able to field test them. Nonetheless, we include this preliminary work in this appendix.

We include these statistics and measures in Appendix II as they suggest additional areas where the study team had started work. They are also included because they may be of interest to other researchers or practicing reference librarians as they continue to develop statistics and measures to assess digital reference services. We stress, however, that the statistics and measures included in Appendix II have not been fully developed and proceduralized, have not been field tested, and are included only as illustrative areas for future research.

Number of initial digital messages received

Definition: The number of initial digital messages received refers to the number of incoming messages that are received from users as the first point of contact with the digital reference service. These messages may be received via email or initial chat transmission or digital video or digital voice session. Each initial digital message received may contain more than one reference question. If this is the case, for this statistic only, count the initial contact message as one digital message received. This statistic will be measured as initial digital reference messages received per week in order to standardize for comparison purposes.

Rationale: This measure is used to serve as a point of comparison with the number of digital reference questions received (*Measure 1-Number of Digital Reference Questions*) to determine the extent to which incoming messages may be packed with more than one digital reference question. The collection of this statistic may be useful in the design of the vehicle (email, webform, etc.) through which the user first contacts the service. This statistic may also be used as a control factor to assure that each digital reference question received is handled appropriately.

Subject analysis, classification, and tabulation of question

Definition: Each reference question will be analyzed and assigned to a subject classification. The total number of questions in each classification will be tabulated.

Rationale: The subject analysis, classification and tabulation of the reference questions received are important in making collection development decisions and triage decisions and staffing assignments based on areas of expertise.

Session length – real time chat / voice / interactive video session

Definition: This measure will reflect the average time that transpires from the initial login or engagement of the user in the real-time session to the completion of the same session. Use of electronically generated weblogs or reports may assist in the collection of the data needed for this measure.

Rationale: The session length of a real time chat/video transaction can be used to assist in staffing allocation, analysis of the reference transaction process in terms of efficiency and effectiveness in a real time setting, and as a possible point of comparison to other methods of digital reference service delivery. Session length can also be used with the data gathered in the next measure, time to answer questions, to determine the total time taken to answer digital reference questions in a real time service environment.

Time to answer questions – real time chat / voice / interactive video session

Definition: Time to answer questions is the average total length of time it takes to answer the question. Measurement begins at the time the initial real-time session begins and includes any time that transpires until the final response is sent to the user. The time to answer questions in a real-time digital reference service is not limited to the time that transpires during one session. It may take more than one real time session and/or a combination of real-time and async sessions to answer the question.

Rationale: The average total time to answer questions in a real-time digital reference setting can be used to assist in staffing allocation, analysis of the reference transaction process in terms of the efficiency and effectiveness of providing digital reference in a real time setting, and as a possible point of comparison to other methods of digital reference service delivery.

Time to answer questions
Session length – Async response – email/webform submission

Definition: This measure describes the average length of time that transpires between the receipt of the initial reference question via email or webform by the digital reference staff and the time when the final response is sent back to the user. All time that transpires between these two events is counted and includes any time that is taken assisting the patron with the technology and any communication that takes place back and forth to clarify the question and/or answer.

Rationale: A measurement of the average session length of async email/webform sessions is a useful measure that can give an estimate of the average amount of time it will take to answer a digital reference question when the staff member has time to read the question and respond without the user waiting for an immediate response. This measure can be used to help in determining the amount of staff time to devote to digital reference, whether to limit such real time email sessions to rush questions or certain types of questions. This measure can also be compared to the other session length measures to develop an analysis of the most effective and efficient method of providing digital reference service and to determine if a particular type of session is more useful for particular question types.

Appropriateness of referrals

Definition: The appropriateness of a referral is a qualitative measure based on an analysis of a referral response to determine if the response met the criteria for referral: non-affiliated users, inappropriate question for service (e.g. service only answers ready reference type question), best response might be given using more traditional service, lack of appropriate digital resources for question, etc. The response to this question will be answered "appropriate", "inappropriate," or "don't know."

Rationale: The appropriateness of referrals measure is useful in determining if the digital reference staff is making accurate determinations regarding whether the question received fits within the scope of the service. This measure can also be used to determine whether the referral was made to the appropriate place.

Ratio of number of reference questions submitted via the website to number of user sessions on library website

Definition: This ratio will compare the number of reference questions submitted via the website [RQSW] as determined through log analysis to the number of user sessions logged on the entire library website [USLW]. This ratio will be expressed as:

$$RQSW : USLW \text{ or } \frac{RQSW}{USLW}$$

Rationale: This ratio is analogous to the ratio of the number of reference questions asked in a traditional library setting to the total number of visits to the library (turnstile count). Additionally, this measure can be used to assess placement of the digital reference question page within the library website: number of users who view the website as a resource for answering reference questions to those who utilize it in general.

Link Analysis

Definition: Link Analysis is a measure of the total number of individual addresses of other websites linking to the digital reference service website/page.

Rationale: This measure will help determine the nature and number of electronic access points to the digital reference service, which can be helpful in developing advertising and public relations for the service, analyzing the range of service and potential target population, and potentially for analyzing the reasons for submission of questions by non-target population users. Additionally, this measure can be used in determining the degree of organizationally specific references when designing self-service reference resources (pathfinders, FAQ's, metalists) for the Digital Reference web page.

User's perception of accuracy

Definition: User's perception of accuracy describes the user's concept of the correctness of the response received to his or her question. This perception may or may not reflect the actual accuracy of the response.

Rationale: Accuracy is a measure closely related to correctness. The accuracy of a response may be used to determine the currency of collections including both electronic and traditional resources (from which information may be transmitted to the user electronically). The user's perception of accuracy, however, may not reflect the actual accuracy of a response. An analysis of such perception can help staff in the development of skills in explaining why they believe their response is accurate.

User's perception of completeness of the service.

Definition: User's perception of completeness of the service describes the user's assessment of whether the response received to his/her reference question has completely answered the question and, in addition, whether the service itself has been completely given (e.g., did the service provider follow-up after the answer was given to assure that the response was everything that the patron was expecting?).

Rationale: User's perception of the completeness of service can be used to analyze and manage customer service issues with the staff. It can also be used to develop policies about procedures for points of contact throughout the reference transaction process. The user's perception of the completeness of service can be used to develop digital reference service policies that address the comprehensiveness of the response. This measure can also help in the collection development process in assessing such issues as whether the databases in the collection contain enough full-text material in proportion to citations and abstracts, if the online resources contain the degree of sophistication required by the user, if the service has enough access to primary resource material, etc.

Start-up costs versus ongoing costs

Definition: Start-up costs versus ongoing costs is a comparison of the total cost of initiating a digital reference service (including equipment and software purchase, database licensing, staff hiring, consulting fees, infrastructure purchases, space rental if needed, initial training, PR campaign launching the service, telecommunication start-up costs, etc.) to the ongoing costs (equipment and infrastructure maintenance and replacement, ongoing salaries and raises, licensing renewal fees, continuing education for staff for updating of skills, annual telecommunications charges, and continuous monitoring of software, hardware, practice and policy changes in the market environment, etc.).

Rationale: An understanding of the start-up costs as compared to the ongoing costs will help in the year-to-year budget process and also will allow for the possible amortization of start-up costs over time. This measure is especially useful for those who have not begun digital reference service or those who are in their initial year.

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